

Seventh Edition

Walter Pauk

Special Edition for Mesa State College

College

How to Succeed in





Contents

How to Study in College

Special Edition for Mesa State College

Seventh Edition

Walter Pauk

Houghton Mifflin Company Boston New York

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Cover Art: Corbis Images

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Printed in the United States of America.

ISBN: 0-618-26842-1
N01099

1 2 3 4 5 6 7 8 9 - DS - 04 03 02

 **Houghton Mifflin**
Custom Publishing

222 Berkeley Street • Boston, MA 02116

Address all correspondence and order information to the above address.

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To the Instructor of the Seventh Edition

Time after time, students have told me that by learning a particular technique for taking useful notes or reading and retaining a textbook assignment they have achieved major breakthroughs. Moreover, these breakthroughs in a particular subject often jump-start the entire learning process and extend to all other subjects.

Students who are seeking help are not primarily interested in theory, and most of them have little patience with merely inspirational talk. They want practical instruction on how to succeed academically. They want something that they can readily understand and apply and that works. After a week of classes, they discover that the hit-or-miss tactics that got them through high school are grossly inadequate and inefficient at the competitive college level. So they turn to us for help.

Let's then teach these students proven techniques for studying and learning.

How to Study in College is brimming with exciting techniques, based on widely tested educational and learning theory, that have already helped myriad students. But the tail of theory is never allowed to wag the practical, feet-on-the-ground dog. While theory is always implicit and is sometimes given in enough detail to explain the rationale behind a particular technique or reassure the skeptic, it is never presented without explicit applications and never used simply as exhortation. After all, the person who needs penicillin is hardly cured by learning the history of antibiotics!

Because it is so crucial that students learn for the long term, I am wholeheartedly against techniques that stress mere memorization. Such techniques fill the mind with "knowledge" that melts away after a test and leaves learning still to be done. The techniques presented in this book result in real learning. And real learning, like a real diamond, lasts.

Finally, no textbook—no matter how complete or current—is truly useful if it is boring, confusing, or excessively difficult to read. I have therefore tried to write in a conversational tone so that reading this book is like having a sincere, person-to-person chat.

WHAT'S DIFFERENT IN THE SEVENTH EDITION?

In this new edition, one completely new—and very important—thrust has been added. In addition, valuable changes and adjustments have been added throughout to material retained from the previous edition.

New! Vocabulary Development

The principal new thrust in this edition is a bold emphasis on lifelong vocabulary development. To be lasting and meaningful, vocabulary development must have as a motivational force one nonpareil quality—*interest*. This interest, to be genuine, must come from within; that is, it must have been internalized. Internalization? But how do you instill a love for words within a student? For instilling, not forcing, I have two suggestions. One suggestion is to use a book such as *Picturesque Word Origins*, which illustrates words through pictures. For example, the word *neighbor*, which once meant “a nearby farmer,” is depicted there by a plowman waving to another plowman in a nearby field . . . and this picture of a word turns an inert string of letters into a being with a personality of its own.

Since it is hard to find this out-of-print book, I have done the next best thing—provided a picture of one word on the vocabulary page at the end of each chapter. I believe that these illustrated words will help to instill a love of or an interest in words in many of our students.

Biographies: Reading That Inspires

The second suggestion for instilling in students a love for words is having them read biographies of some famous women or men who, through acquiring a solid vocabulary, overcame illiteracy and achieved both academic and worldly success. A brief “critical incident” in the life of Malcolm X exemplifying this is narrated in his autobiography. Along with the autobiography of Malcolm X, I’d recommend and urge students to read the biographies of Booker T. Washington and George Washington Carver. Why biographies of these famous men? Here’s why: Reading textbooks and lectures, one learns from relatively inert substances. But reading biographies, one learns through sympathizing and empathizing with a real person, thus gaining a living picture that, when internalized, can often launch a reader into the fascinating world of word-knowledge, making his or her life forever richer and perhaps more exciting. The three true-to-life books are as follows:

1. *The Autobiography of Malcolm X* with the assistance of Alex Haley. Ballantine Books, 1964.
2. *Booker T. Washington* by Basil Mathews. Harvard University Press, 1948.
3. *George Washington Carver: The Man Who Overcame* by Lawrence Elliott. Prentice-Hall, 1966.

I have read each of these three books twice, and each time I was inspired and re-inspired by the courage and stick-to-it-ive-ness of these men in unselfishly preparing themselves to help other human beings. For example, George Washington Carver developed more than three hundred uses for the peanut, soybean, and sweet potato. Now, the small southern farmer had a cash crop that he could grow on his relatively small farm. Carver's dedication knows almost no equal. He was known internationally. Gandhi, a strict vegetarian, used Carver's recipe to make milk from the peanut. Thomas Edison offered him a salary of \$175,000 a year and Henry Ford offered money and laboratories; instead, Carver took the offer from Tuskegee Institute—\$1,000 a year, plus board. He never asked for nor was given a raise. He spent forty-seven years at Tuskegee and left his life savings of \$40,000 to a foundation for agricultural research.

Just a few more words about this remarkable man. He was born to slave parents in 1859. Being of fragile health, he worked as a cook for Moses Carver, the plantation owner. The Carvers supplied him with the "blue-backed speller," which was the elementary book of its day. Under the dim light of a lantern, he mastered every word.

Now, a final word: The blue-backed speller—its words—was the magic. Without words, he might have spent his life as a first-class cook. With words, his name and work achieved immortality.

Words in Context

On the vocabulary page at the end of each chapter, the pictured word is followed by a "Words in Context" section. The context is comprised of selected quotations that have two things in their favor: (1) Context for particular words is supplied, and (2) some meaningful knowledge is imparted in both the words and the full quotations.

New! The Word History System

The Word History System is presented in emphasized form for the first time. The main idea is that an individual, free-floating word, to be remembered, must be attached to a fairly solid foundation. The foundation is the word's

history, discovered by a careful reading in an unabridged dictionary or, better yet, *The American Heritage Dictionary*.

The Word History System is simple and straightforward. The memorization of Greek and Latin roots, prefixes, and suffixes does not form its base. But yes, the prefixes, roots, and suffixes may be used for better understanding of an individual word when the definition in a dictionary is pondered.

The rationale for the vocabulary questions is *not* to test, but rather to teach. The words in these questions, if new, might appeal, leading a student to note them for further study in a dictionary. If already familiar, such words provide vocabulary reinforcement.

Spotlighting New Bright Spots

A significant addition was made to Chapter 1, "Setting Goals—A Self-Management Skill." A long article by David G. Williams, a medical doctor—titled "What Do You Want to Be When You Grow Up?"—was added. Dr. Williams says that a better question would have been "What would make you happy?" Answering this question should bring a student's career decision into better balance than pondering only "Where can I earn the most money?" This advice from a medical doctor carries a lot more credibility than would the same advice given by a nonmedical person.

In Chapter 3, some shocking statistics and research studies show the devastating health effects of soft drinks. First, more soda is consumed than water. In a 2-liter bottle of soda (67.6 ozs.), there are about fifty-six teaspoons of sugar. Would anyone in his or her right mind sit at a sugar jar and shovel in this amount of granulated sugar? Probably not, because a person would reason that so much sugar is not good for one's health; nevertheless, many are doing the same thing in liquid form. Second, soda throws the phosphorus-calcium ratio dangerously out of balance. Third, the brown coloring in sodas affects the immune system, which is our basic protection against all kinds of diseases.

Smoking: Articles in papers and magazines report that defiant smoking is sweeping many campuses. In that connection, Chapter 3 reports this shocking statistic: One cigarette cuts seven minutes from a life span.

In Chapter 5, under the heading "Controlling the Number and Form of Your Memories," we have an interesting judgment about the vast importance of George Miller's article, "The Magic Number Seven, Plus or Minus Two."

In Chapter 12, under the heading, "The Questions in-the-Margin System," Scott Solomon has added some important refinements, such as using 0.3-mm lead to work legibly in the narrow space of the margins and numbering the notes in the margin as well as the portion of the text to which they refer, so that accurate coordination is maintained.

VALUABLE FEATURES RETAINED

- The “concept map” technique has been continued in this edition. It would be good to remind the students that much can be gained from these maps, both before reading the chapter and, perhaps even more, after reading the chapter. Before reading, students can acquire advance *organizers*, which, according to David P. Ausubel, can help them learn and remember material they encounter in the chapter itself. After reading the chapter, the concept maps provide a bird’s-eye view of the entire chapter, showing the main concepts with linking lines that establish relationships.
- In this book, the principles, systems, and techniques are the vital determinants that will enable students to succeed academically. When these determinants are mentally absorbed, students can then use and adapt them to fit their learning styles. It is *not* the end-of-the-chapter exercises that will have a permanent effect on the students. It is the basic, sound principles, systems, and techniques. This is why the chapters are not diluted but rather kept crisp, compact, and uncluttered. I think we all agree that for a program to be successful, it must have basic soundness. Actually, no one knows what is the best way for any individual student to learn. Therefore, our mission should be to present clearly the best principles, systems, and techniques and then let students use them in their own personal and unique ways.
- Each “Have You Missed Something?” chapter quiz includes questions to reinforce students’ understanding of key concepts. And once again, the rationale for these questions is not to test but rather to teach. If the chapter is read with care and understanding, any student should achieve a perfect score.

ACKNOWLEDGMENTS

Sincere words of thanks go to those who are permanently linked to this book: the late Henry F. Thoma and Ian D. Elliot.

Sincere thanks also go to the contributors of material in previous editions: Professors Harrison A. Geiselmann, Kenneth A. Greisen, and Jane E. Hardy, all of Cornell University; Professor William G. Moulton of Princeton University; Professor James A. Wood and Dr. Nancy V. Wood, both of the University of Texas at El Paso.

I have been very pleased by the work done by Professors Mike Radis and Ron Williams of Pennsylvania State University, who prepared the

"Questions for Further Study and Discussion" that first appeared in the Instructor's Resource Manual for the Fourth Edition. Professor Carol Kanar of Valencia Community College assisted with the updating and revising of material included in the prefatory section titled "To the Student." I thank them all for their valuable assistance.

Now for a very special acknowledgment: I am grateful to my friend Ross James Quirie Owens, whose experience as a writer, newspaper editor, director, cinematographer, and currently, executive managing editor of *InfoWorld* (a publication devoted to computers) prepared him to take full charge in revising, editing, and improving the Fifth Edition. His talents are still apparent in the Sixth and Seventh Editions—in the mini-overviews and concept maps at the beginning of each chapter and in the quizzes and questions at the end, as well as in the Instructor's Resource Manual.

I would also like to thank the reviewers of previous editions as well as these reviewers of the present Seventh Edition for their helpful suggestions:

Linda Bagshaw, Briar Cliff College, IA

Ronald K. Burdette, Montgomery College, Rockville Campus, MD

Dona Marie Fabrizio, Widener University, PA

Mark Overton, Point Loma Nazarene University, CA

David A. Strong, Jr., Dyersburg State Community College, TN

Dr. Peggy Walton, Howard Community College, MD

Donna Wood, State Technical Institute, TN

Finally, I am eternally grateful to my many students who have taught me much—so that I may pass on a little more to others.

W.P.

To the Student

How did Helen Keller learn to read and communicate, in spite of being blind and unable to hear? Why did Abraham Lincoln walk twenty miles to borrow a book? How did Booker T. Washington, born in slavery, travel five hundred miles to a high school where he could get the education he craved? Each was motivated by the will to learn. Each so desired learning for its own sake that he or she allowed few things to interfere with that goal.

Perhaps you know people like Keller, Lincoln, or Washington. Perhaps you are such a person yourself. If you are, you have already discovered that the desire to learn can give you the strength to start projects, see them through during difficult spots, and finish them with satisfaction. In college, you are likely to find that the will to learn—perhaps more than any other single factor—will help you the most, particularly when you falter from time to time. On a cold winter morning, it's far easier to get out of bed if you want to ace a mid-term than if you don't really care about your performance!

USING THIS BOOK

No matter what academic goals you've set for yourself, this book can help you achieve them. In theory, there is no limit to learning and no limit to how you can improve your natural abilities to understand the material you study. By applying the techniques presented here, you will quickly begin to improve as a student, making your college experience a rewarding one.

HOW TO USE THE "HAVE YOU MISSED SOMETHING?" QUESTIONS

The end-of-chapter questions are designed to teach, not test; you'll find no trick questions and no traps to lead you to an incorrect answer. Take each question at face value and answer it to the best of your ability. Use any

incorrect answers you give as opportunities to reread the pertinent portion of the chapter. By rereading and rethinking the question and answer, you will greatly strengthen your understanding of the entire concept.

A SECOND CHANCE

The Nine-Dot Problem (Figure 1) not only demonstrates a point; it is also an excellent learning device. For instance, although very few students have solved the puzzle, they nevertheless have learned to break out of the conventional-thinking mold and let their minds rove more freely, which leads to more innovative and imaginative approaches to solving problems.

To prove that you, perhaps, have learned a great deal from this one puzzle, apply your newfound knowledge to the problem shown in Figure 2.

DISCOVER YOUR OWN RESOURCES

“Know thyself” is wise advice for a student poised at the path that leads to an academic goal. Development of your skills begins with understanding your personal learning style and study skills. By identifying your preferences and strengths, you can zero in on the best study skills techniques for you.

The following list can help you identify your basic learning style. For each item, circle the letter that best matches your style. Keep your responses in mind as you read this book.

Learning Styles Self-Assessment

1. I study better (a) by myself; (b) in groups; (c) in a combination of the two.
2. I remember best when (a) I’ve *heard* something; (b) I’ve *read* or *seen* something; (c) I’ve *done* something active, such as problem solving.
3. I think I’m (a) better with facts, such as names or dates; (b) better with concepts, ideas, or themes; (c) about the same with both.
4. I learn better when I read (a) slowly; (b) quickly; (c) either way.
5. I study more efficiently in (a) one solid study period; (b) small blocks of time.

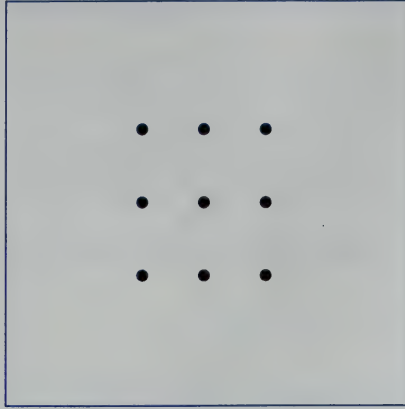


FIGURE 1 The Nine-Dot Problem

Connect these dots by drawing four straight lines without taking your pencil from the paper and without retracing any lines. The solution appears on page xxvi.

6. I work (a) well under pressure; (b) poorly under pressure.
7. I work (a) quickly, for short periods of time; (b) at a steady, slower pace for longer periods of time.
8. I (a) do learn best in a structured setting, such as a classroom or laboratory; (b) do not learn best in a structured setting.
9. I think that the greatest strength of my learning style is wanting to
10. I think that the greatest weakness of my learning style is not enough sleep



FIGURE 2 The Puzzle of Squares

How many squares are there in this figure? The solution appears on page xxvii.

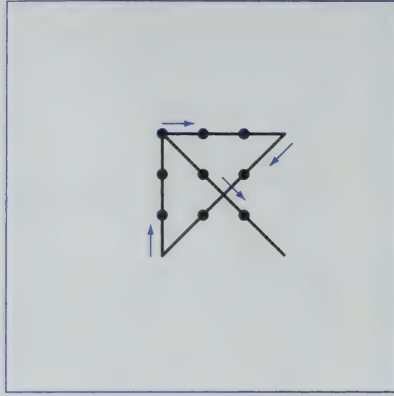


FIGURE 3 Answer to the Nine-Dot Problem
Begin at the top left corner and follow the arrows.

You'll improve your chances of success if you balance this knowledge of your learning style with a willingness to remain flexible. For example, you may be thinking, "It's true. I'm a sprinter who begins working with a burst of energy and then slacks off. That's the way I've always been. How can I possibly change?" Or you may believe that studying all night is an effective way of coping with a tight schedule and that you have no need for a more conventional strategy. These ways of thinking probably feel comfortable, but they may have created blind spots in your view of studying. To get a sense of how blind spots can limit you, try to solve the problem shown in Figure 2. Odds are that a blind spot will prevent you from solving it. Yet once you see the solution, you'll probably say, "How easy! Why didn't I think of that tactic myself?"

TAKE ADVANTAGE OF YOUR SCHOOL'S RESOURCES

College Catalog General information about your college's requirements, policies, programs, and services appears in the college catalog. Make sure you have a copy and use it often during the first weeks of classes to remind yourself of requirements and deadlines to be met.

Student Handbook The student handbook provides information about your school's procedures, regulations, and code of conduct. It may also

1×1 Squares	16
2×2 squares	9
3×3 squares	4
4×4 squares	1
Total squares.	<hr/> 30

FIGURE 4 Answer to the Puzzle of Squares: 30 squares.

describe the school's requirements for good academic standing and graduation. For details or for specific department requirements, consult your department office or your academic adviser.

Admissions or Registrar's Office You can find answers to questions about grades, transcripts, and college requirements in the admissions or registrar's office. Admission to college and registration for courses begin with this office.

Office of Financial Affairs For answers to questions about scholarships, loans, and grants, contact the financial affairs office. You will come here to pay fees and fines and to pick up your checks if you are in a work-study grant or program. If you want a part-time job on campus for which you must qualify on the basis of your financial status, you will fill out application forms in this office.

Career Development and Placement Office If you want help choosing a major or setting a career goal, contact the career development and placement office. People in this office can administer various interest, personality, and skills assessment tests to help you determine the kind of work for which you are best suited. They can help you find jobs on and off campus. Some career development centers sponsor on-campus recruitment, inviting businesses to interview prospective graduates and aiding them in submitting applications and résumés. After graduation, you can file a résumé in the placement office if you want your school's help with landing a job.

Academic Advising Office or Counseling Department Academic and guidance counselors can help you with everything from choosing the right course to solving personal problems that prevent you from meeting

your academic goals. The academic office or counseling department may be part of the admissions office, or it may be a separate department. In many colleges students are assigned to an adviser or a counselor who follows their progress throughout their college careers.

Student Health Center If you become ill, you can go to a doctor at the health center. The health center may have a pharmacy and may provide a limited amount of hospital care. Some mental health services may be available through this center, through the office of a school psychologist or psychiatrist, or through a peer counseling group. The health center may also refer students to an agency outside the college.

Student Government Association Working with the dean of students, the student government association sponsors student activities such as intramural events, dances, special-interest organizations and clubs, and other social and academic events. (Joining a club or taking part in campus events is a good way to meet other students who share your interests.) In addition, your student government may publish a weekly bulletin or a student handbook that summarizes college requirements and resources.

Student Publications The college newspaper or literary magazine offers contributors unique opportunities for self-expression and provides readers with information and entertainment. Serving on the editorial staff of one of these publications may also fulfill some journalism or English requirements.

Learning Lab or Skills Center You may turn to the learning lab or skills center for help in improving your study, reading, writing, math, or computer skills. Whether you are required to spend time in a lab because of your performance on a college skills assessment test or you choose to go on your own, take full advantage of the opportunity to gain the skills you need.

Special Student Services Veterans, students with physical or learning disabilities, minority students, international students, and students who are economically disadvantaged may need the special assistance of a trained support group to meet their academic goals. If you think you qualify for these services, ask your counselor or adviser about them. Your college may also offer services such as off-campus residence listings.

Athletics Office A listing of the college's athletic programs and events is available in the athletics office. This is the office to visit if you are interested in participating in sports.

Resident Assistant For on-campus students, resident assistants (RAs) can be a great source of information about campus services. Although RAs are not professional counselors, they have recently been through many of the experiences you're undergoing and can probably direct you to the campus office best suited to your needs.

THE POWER OF WORDS

Eddie Rickenbacker, who left school at age twelve to help support his widowed mother, gained an education by carrying a small dictionary in his pocket. He later became chairman of Eastern Airlines.

The following three men were all illiterate until they became interested in words. First, Malcolm X became an outstanding preacher and public speaker. Second, Booker T. Washington founded Tuskegee Institute and, as its president, guided the school for thirty-four years. Third, George Washington Carver, through chemistry, developed more than three hundred uses for the peanut, soybean, and sweet potato.

Yes, it's one thing to become interested in words, but it's another thing to build a large and precise vocabulary. To build, you'll need a system.

The Word History System is the answer to building a large and precise vocabulary. To be remembered and used correctly, a word must be linked to some of its meaningful history. Without a historical background, the word, like a gas-filled balloon, usually floats freely out of sight and out of mind.

In Chapter 6, you'll be introduced to and schooled in the full use of the Word History System. The system is specifically applied to one pictured word at the top of the vocabulary page at the end of each chapter.

Following the pictured word are a number of italicized words embedded in the context of a quote. These quotations, in themselves, are educational and insightful.

As you work your way through the vocabulary page, some words will appeal to you as *your type of words*. These are the words you'd like to master so that you can use them in your speaking, writing, and thinking. Here's the action to take:

✱Take a 3 × 5 card (which you can easily carry for study in spare moments) and write on one side the phrase in which the word is embedded. You want context. Underline the target word.

After you've collected five or six of these words, find time for some library work with dictionaries.

On the front of the card, make sure that you write the word in syllables, including accent and diacritical marks so that you can pronounce it correctly.

(FRONT)

Don Quixote and his faithful
companion, Sancho Panza

com-pan'ion

(REVERSE)

companion: one who shares bread
with another.

"Breaking bread" together is an
ancient rite of friendship.

com = with

panis = bread

Now: one who accompanies another
with no longer a reference to sharing
bread.

(FRONT)

escape from Alcatraz
was impossible.

es-cape'

(REVERSE)

escape: to slip out of one's cape.

The word gives us a picture of a
prisoner, held by his cape or coat,
who suddenly slips out of the
garment and flees.

Latin: ex cappa = out of one's
cape or cloak

Now: to break loose from confinement;
get free.

The reverse side belongs to the word's history. However, at the very bottom of the card write the present definition, which you can get from any good "collegiate" or unabridged dictionary. (See illustration for form.)

A wide and precise vocabulary is really the main ingredient or quality that provides all of us with the endless ability for better thinking and judgment in all phases of life—personally, socially, and professionally.

A FINAL THOUGHT

To state in one sentence what I try to do in this book, let me rely on the words of Ralph Waldo Emerson: "The best service one person can render another person is to help him help himself."

SETTING GOALS— A SELF-MANAGEMENT SKILL

Most of us go to our graves with our music still inside us.

—OLIVER WENDELL HOLMES (1809–1890), AMERICAN PHYSICIAN AND WRITER

There's something deep inside each of us that yearns for fulfillment. We were meant for something to which our nature inclines. But what? No one really knows. So, you yourself must dig. Dig—but for what? Start by digging for happiness. Ask, "What kind of work would I be happiest in? Doesn't it make sense that every day's work should be a joy?" In this chapter, the focusing of your life can begin as you read and think about:

- Deciding what would make you happy
- Making a plan
- Writing your goals
- Taking action

SETTING GOALS — A SELF-MANAGEMENT SKILL

Shaping Your Future Through Goals

Norman Vincent
Peale's Power of
"Imaging"

Your GPA — Goal, Plan, Action

Man on the Moon,
the Classic
Example

Goal-Type Questions

Role of Goal
Considerations:
Minor Goals
Major Goals
Modifying Goals
Doctor's Goals

Making a Plan

Efficient Plan:
How to Know
Personal Goals

Taking Action

Procrastination:
Preventing
Procrastination

Norman Vincent
Peale's Wisdom

Goals bring meaning to life; otherwise, life can be aimless. Viktor Frankl's research revealed these stark data:

When 60 students were asked why they had attempted suicide, 85% said the reason had been that "life was meaningless."¹

Goals have to go beyond earning your "bread and butter," as is shown in the following slice of human life:

Governments, guided by social scientists, used to say that if you just improve the socio-economic status of the people, everything will be OK, people will become happy. The truth is that as the struggle for survival has subsided, the question has emerged: survival for what? Ever more people today have the means to life, but no meaning to live for.²

Goals and purpose breathe meaning into life. Goals and purpose form the psychological underpinnings of our individual lives. There's power in purpose, as is shown in this excerpt:

We cannot have deep and enduring satisfaction unless we have self-worth. We cannot have self-worth unless our lives are an earnest attempt to express the finest and most enduring qualities that we are aware of. Purpose is an important condition for an enduring satisfaction with life.³

To bring meaningfulness into your life, you must **decide** on your own goal. No one can dig into your heart and mind and come up with a goal that you would have decided on if you had been doing the digging. It is easy to fall into this trap:

To base your choice on "what is expected of you"; rather than on "what is meaningful to you."⁴

Yes, it can be a good idea to discuss your goals with friends and family. It is good to ponder their thoughts and advice; but process these through your own brain cells and heart cells and then make a decision, which must be your very own. Above all, don't follow the crowd.

DON'T FOLLOW THE CROWD; THINK FOR YOURSELF

When you become part of the crowd, your individual thinking is replaced by crowd psychology. Here's how Gustave LeBon, a French social scientist, described crowd psychology:

¹Viktor Frankl, an Austrian psychiatrist and psychotherapist, created the theory of Logotherapy, which states that a person's primary motivation is their search for meaning in life.

²Richard J. Leider, *The Power of Purpose* (San Francisco: Berrett-Koehler Publishers, 1997), p. 35.

³Ibid.

⁴Leider, *The Power of Purpose*, p. 55.

Goals
Purpose

The most striking peculiarity presented by a psychological crowd is the following: Whoever be the individuals that compose it, however like or unlike be their mode of life, their occupations, their character, or their intelligence, the fact that they have been transformed into a crowd puts them in possession of a sort of collective mind which makes them feel, think, and act in a manner quite different from that in which each individual of them would feel, think, and act were he in a state of isolation.⁵

Don't let crowd psychology rob you of your isolation or rob you of your freedom to think and decide individually. In sum, preserve yourself as a sovereign individual so that, for better or for worse, you are the ruler of your career and destiny.

LeBon's ideas were adopted and furthered by Edson Gould, one of the most respected names on Wall Street, who used this easily visualized example to illustrate how the individual is almost powerless to resist the powerful magnetism of the crowd:

You're *alone* in an empty movie theater and hear the cry of "fire." You look around, see no flames, smell no smoke, you *calmly walk* to the nearest exit. But, repeat the same cry of "fire" (again without flames visible or the smell of smoke) in a *crowded* theater and once the *crowd* starts *running* for an exit, you'll find *yourself running*, too. That's crowd psychology.⁶

Remember, always isolate yourself from the crowd. Preserve your sovereign individualism.

*Isolate
yourself*

SHAPING YOUR FUTURE THROUGH GOALS

A goal is far more than a word. Actually, it's a dream that has been mentally acted and reenacted. What lawyer hasn't first imagined presenting a closing argument to judge and jury? What business executive hasn't imagined outlining an exciting plan to a staff seated around the board of directors' table?

Up to this point, the word *imagined* has been used to denote imagination; however, in all the excerpts in this chapter from Norman Vincent Peale's book *Positive Imaging*, the word *image* is used to convey a much deeper concept, which is as follows:

Imaging consists of vividly picturing, in your conscious mind, a desired goal or objective, and holding that image until it sinks into your unconscious mind, where it releases great, untapped energies.⁷

⁵Quoted in Dan Sullivan, *The Chartist* (December 30, 1997): 4.

⁶Quoted in Edson Gould, *Findings & Forecasts* (New York: Anametrics, 1974).

⁷Norman Vincent Peale, *Positive Imaging*. Copyright © 1982. Published by Fleming H. Revell, a division of Baker Book House. Reprinted with permission.

So, if we think deeply enough and image vividly enough about what we want to do with our lives, our whole being can be energized. Norman Vincent Peale, one of the most widely read inspirational writers of all time, goes on to say:

There is a powerful and mysterious force in human nature that is capable of bringing about dramatic improvement in our lives. It is a kind of mental engineering. . . . In imaging, one does not merely think about a hoped-for goal; one "sees" or visualizes it with tremendous intensity. Imaging is a kind of laser beam of the imagination, a shaft of mental energy in which the desired goal or outcome is pictured so vividly by the conscious mind that the unconscious mind accepts it and is activated by it. This releases powerful internal forces that can bring about astonishing changes in the life of the person who is doing the imaging.⁸

* To set the stage for imaging, I believe that you can find and clarify your goal through the following questions and answers.

What "Z"s Which answers?

What Is the Best Way to Become a Success?

"If you want to make it in college, your GPA is the key." Students who tell you this are talking about your grade point average, your report card, the number of A's and B's you get in relation to the number of C's, D's, and F's. There's no question that grades can be important, but they aren't as important as another GPA: your Goal, your Plan and the Action that you take. If you really want to make it, then *that's* the GPA you should strive for. If you are able to set a specific Goal in your life, if you can come up with an efficient Plan for that goal, and, finally, if you have the discipline required to take Action, there's an excellent chance you will be headed down the road to success.

What Is the Role of a Goal?

Dance/acting

Where are you headed? That's the question that your goal is designed to answer. Imagine throwing ingredients into a mixing bowl without any idea of what you are making. Think of running around on the basketball court with no knowledge of the object of the game. The best cooks and the best basketball players know both what they are doing and why they are doing it. They have a clear idea of where they are headed. In short, they have a goal in mind.

⁸From Norman Vincent Peale, *Positive Imaging*. Copyright © 1982. Published by Fleming H. Revell, a division of Baker Book House. Reprinted with permission.

A FAMOUS GOAL, PLAN, AND ACTION

The Goal

First, I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to earth.

*President John F. Kennedy
before a joint session of Congress
May 25, 1961*

The Plan

The Mercury Program:

Each rocket would send a single astronaut into space.

The Gemini Program:

Each rocket would send two men into space to orbit the earth, to practice docking with other spacecraft, and to test human beings' ability to withstand prolonged periods in space.

The Apollo Program:

Each rocket would send three men into space in order to leave the earth's orbit, to orbit the moon, and eventually to land on the moon and explore it.

The Action

The United States sent twenty manned flights into space between May 1961 and June 1969. In July 1969, eight years and two months after President Kennedy set the country's original goal, astronauts Neil Armstrong and Erwin "Buzz" Aldrin set foot on the moon and returned safely to earth.

What Kinds of Things Could Be Considered Goals?

Although winning a basketball game and baking a cake can both be seen as goals, it can be easier to look on your goal as a kind of destination. A lot of our common expressions make use of this idea. "Making it to the top," "climbing the corporate ladder," and even "reaching for the stars" portray the goal as a place in the distance that you are trying to reach. Of course, some goals really are destinations. When American pioneers declared that their goal was "Pike's Peak or Bust" and tacked the sign to their wagons, they were talking about an actual destination hundreds of miles to the west and more than fourteen thousand feet above sea level. When President Kennedy made the moon the country's goal in 1962, he was aiming for a destination that was about 238,900 miles out into space.

Do Smaller Goals Have Any Use?

Your life should be full of goals both major and minor. Most of us are aware of minor goals; we set them all the time. Passing a test can be seen as a minor goal. So can completing a homework assignment or even finishing a chapter before dinnertime. It can be a great help to have minor goals. Each time we reach one, we get a small sense of victory that helps to spur us on toward something even bigger. Notice in a basketball game how the crowd cheers and the scoring team's pace quickens each time a basket is made. Everyone knows that one basket by itself won't win the game, but when the score is added up, each basket can prove to be crucial. The same is true in school. Although no one has gained success by virtue of a single test or paper, these little victories will add up and help you move toward your major goal. In the meantime, minor goals provide the encouragement you need to cheer yourself on and to quicken your pace.

How Do You Choose Your Major Goal?

Dancer/Actress

Choosing a major goal will come naturally for some, while it may be an agonizing decision for others. For every person who says, "I've always wanted to be a doctor" or "I know that teaching others is what really matters to me," there are those who complain, "There's really nothing I'm interested in" or perhaps "I'm interested in practically everything; how am I ever going to choose?" Although goals may vary widely from person to person, they all grow out of the same source: the things we want and need. Therefore, choosing your goal means deciding what you value most in life.

How Large Should a Major Goal Be?

Your major goal should be large and distant. It should act as a target you can aim for, something you can think of to inspire you. Don't let short-term minor goals like finishing an assignment, passing an exam, and simply getting through the day mark the limits of your dreams. Aim high but at the same time be sure that the goals you set are specific and distinct. Health, happiness, security, love, and money are all ideals that people aim for, but they are far too vague to be considered goals. On the other hand, "discovering a cure for cancer" and "becoming the best possible parent" are both admirable and specific goals that can help you approach the broad ideals we all share.

*Don't be too vague
in choosing a goal.*

What Should You Do with Your Goal Once You've Chosen It?

*• write it down
(constant reminder)*

If the goal you have chosen is a clear one, you should have no trouble writing it down. Goals that stay only in your head have too great a chance of remaining vague. Furthermore, once you write down your goal, that documentation can act as a constant reminder. If you're feeling discouraged, a quick look at your goal can serve to inspire you. (That's what the signs on the covered wagons did.) And if for some reason you forget your goal, a written description can refresh your memory.

Are You Stuck with a Goal Until You Reach It?

Not so forceful

The purpose of a goal is not to force you on a course that you don't want to follow; it is to give you a target so that your efforts can be more focused than they would be if you had nothing to aim for. Time and fate have a way of shifting our priorities. People change, and so do the things they view as important. If the goal you once wrote down no longer matches your ambition in life, come up with another goal to replace it.

GOALS: THINK QUALITY, NOT QUANTITY

Not for \$

Everyone, it seems, is out to make money, a goal that evidently pervades the minds of many people. Look at the crowds thronging the race tracks of both horse and dog, the casinos in Las Vegas and Atlantic City, the lotteries in local and neighboring states, and even the frequently bubbling stock market. It seems that money is equated with happiness, but many stories in newspapers and magazines show that the one doesn't always follow the other.

The "money idea" has definitely biased the thinking of many students in terms of setting career goals, as is evidenced by this newspaper report: Three out of four college students expect to become millionaires, says a poll by consulting firm KPMG (Klynveld, Peat, Marwick, Goerdeler), New York.⁹ Clearly, career goals can be subtly influenced by unexamined desires that linger in one's psyche—desires for money, prestige, and reaching the top of the ladder. John Rau, who has been the CEO of three corporations and the dean of Indiana University's business school, reminds students of the quality side of life. Philosophically a member of the school of tell-it-to-

⁹Pamela Sebastian, *The Wall Street Journal* (March 25, 1999), p. A1.

me-straight-and-tell-it-to-me-quick, he says, "Unless you're doing the stuff you like, you can burn out."¹⁰ ✎

In line with Rau's succinct pronouncement, Dr. David Williams, too, pulls no punches. As we know, few people know about "burnout" better than medical doctors who deal with the health of people experiencing this phenomenon. After years of treating such people, Dr. Williams took time to write this compelling article on choosing a career that will enhance the possibilities of living a healthier life.

What Do You Want To Be When You Grow Up?

If you're like me, the last time someone asked you this question was quite some time ago. Most of us guys probably responded with something like a fireman, forest ranger, cop, race car driver or even the President. I'm not being sexist (I'm not even sure there was such a word when someone last asked me the question), but if you're female you probably answered the above question with occupations like a model, flight attendant, school teacher or movie star. You chose these answers because at the time you thought these endeavors would be enjoyable. You could visualize being happy. Maybe a more appropriate question than "What do you want to be when you grow up?" would have been "What would make you happy?" And since the answer to this question changes throughout your life, it's a question we really need to ask ourselves more often.

When was the last time you actually got away by yourself and seriously thought about what you needed to be happy? Maybe it's time to do so.

As hectic as life has become, we see happiness as a luxury. Surveys have shown that most people really don't believe it's possible to be happy the majority of the time. They think that true happiness is an unobtainable goal. It's an unpredictable, fleeting sensation over which one has little control. But accepting this idea, that you have no or little control over your own happiness, can have serious health consequences. Happiness is just as important, if not more so, to good health as proper nutrition and adequate exercise. Happiness is a powerful healing force. On the opposite side of the coin we have stress. There seems to be an inverse relationship between stress and happiness. In other words, less happiness leads to more stress. And stress can be an extremely powerful destructive force. Stress is one of the best examples of the power the mind can have over the body.

In animal studies, French researchers at the University of Bordeaux have recently shown that depression and anxiety in adults can be a direct result of placing the mother under stress prior to birth. Stress causes the adrenal glands to produce more of the "stress hormone," corticosterone. Corticosterone easily passes from the mother to the fetus through the placenta. Consistently high levels of corticosterone desensitize brain receptors, altering the feedback system and making it more difficult to shut down the excess corticosterone production. After birth these receptors in the brain remain desensitized, which can lead to

¹⁰Quoted in Hal Lancaster, "Managing Your Career," *The Wall Street Journal* (May 6, 1997), p. B1.

suppression of the immune system, depression and anxiety later in life. (*J Neurosci* 96;15[1 Pt1]:110-6.)

In an amazing study recently performed at Columbia University, New York, researchers found that young girls who suffer from undue stress grow up to be 5 cm. (2 in.) shorter than their happier contemporaries. Stress stunts their growth by depressing the levels of growth hormone in the body.

Volumes have been written on the detrimental effects of stress. And while I won't bore you with all the detailed research here, stress has been linked to everything from asthma and cardiovascular disease to cancer and practically every disease in between. The point to be made here is that happiness replaces and counteracts stress. Probably more than any other single factor, discovering and acting on what makes you happy can improve both the quality and length of your life.

Over the next few hours, days and weeks, I urge you to invest some time in seriously deciding what you want out of life. What would make you happy? I am not talking about what would make you happy for a moment or a day, but instead, what you want and need to be happy for the long term. I can assure you it will be one of the most productive things you will ever do.

Discovering what it would take for you to be happy is, without a doubt, one of the most powerful tools you'll ever possess. It defines your basis for living. It gives you a purpose and provides the answers to life's day-to-day problems. It almost miraculously provides direction at each of life's crossroads. It crystallizes and clarifies your day-to-day goals and activities. It allows you to focus your talents and energies toward achieving the rewards that are most important to you.

If you can't honestly verbalize what you *need* to make you happy, you're going to wander aimlessly throughout life. The clock keeps ticking whether you decide to answer "what would make me happy" or not. Instead of participating and reveling in life, you end up simply reacting to situation after situation. You unquestionably embrace the idea that your own happiness is out of your control. You then begin to believe that it will suddenly appear just as soon as someone or something in your life changes. Unfortunately, that's like playing the state lottery. Your chances of getting hit by lightning are far better than finding real happiness and meaning in your life.

Most of us (I'm as guilty as anyone, if not more so) have a tendency to take life much too seriously. When we were younger it was easier to be less serious. It reminds me of a Bob Dylan song, in which he says, "If you ain't got nothing, you ain't got nothing to lose." The older and more responsible we become, the more we feel we have to lose. We begin to perceive changes in our lives as risks rather than opportunities. As such, we try to avoid change. But in reality, change is not something over which we have any control.

I'm sure you've heard the saying that there are only two things you can count on: death and taxes. Well, there are actually a couple more. One is that your surroundings will change. Technology changes. Weather changes. People change. Everything changes. Always has. Always will. Accept it. Accept the fact that people and situations are *always* going to be changing throughout your life.

Fighting change is like swimming against the current in a river. You're so busy trying to keep your head above water that you never get a chance to see or enjoy what's on the bank. The quicker you accept the fact that everything will

Stress
depressing

What
would
make
you
happy?

The only thing that is constant: CHANGE

change, the quicker you can get out of the water. You can sit on the bank, relax for a moment and evaluate your surroundings. In a life that's always too short, you can then decide how best to spend your remaining time. This brings up the other thing you can always count on—the God-given, human ability to make choices.

Through changes in your thinking, your actions and your lifestyle, you can choose to live your life in a state of unhappiness or in a state of happiness. It's totally up to you.

Although it was several decades ago, I remember sitting at my desk in Mrs. Benger's first-grade class back in Friona, Texas. Above the chalkboard there were two large handwritten signs. One read, "Act the way you want to be and soon you'll be the way you act." It's probably one of the more lasting lessons I've learned in life thus far. (The other sign said, "One who thinketh by the inch and talketh by the yard should be kicketh by the foot." [I'm still working on that one.])

Before you can "act the way you want to be," and before you can expect to find happiness, you must answer that one simple question. "What would make me happy?" It's a difficult question, probably the most difficult you'll ever have to answer. Getting the answer will require some time and serious thinking. Strangely, there's no right or wrong answer. And even stranger is the fact that only you know the answer. Don't think of this as some kind of test. Nobody is going to give you a grade or set any time limits. The only way you can really fail is aimlessly wandering through life and simply not answering the question at all.

So "What do you want to be when you grow up?" "What would make you happy?"

Dr. David G. Williams, "What Do You Want to be When You Grow Up?," from Alternatives for the Health Conscious Individual, Vol. 6, No. 15, September 1996, pp. 119–20. Copyright © 1996, Mountain Home Publishing (800-527-3044). Reprinted with permission.

What makes me happy?

MAKING A PLAN

What Is a Plan?

If you think of your goal as your destination, then a plan can be seen as the route that will take you there. Coming up with a plan is like drawing a map. You need to know where you are starting, where you are heading, and where you plan to stop along the way. Most goals will have several plans. The challenge comes in choosing the best route to take.

goal: destination
plan: route

How Can You Choose the Most Efficient Plan?

An efficient plan is a balancing act between what you need and want and what you are able to pay. Paying, as far as a plan is concerned, doesn't always mean money. It can mean time and energy as well. For example, a

one-week plan for reviewing your notes is “too expensive” if the test is only two days away. In the same way, a plan that forces you to stay up all night will often be too costly, because what you gain in knowledge you will lose in sleep. The most efficient plan will meet your goal without costing too much.

Shouldn't It Be Easy to Tell Which Plan Is the Most Efficient?

Although it might seem as though efficient plans should be easy to construct, the best ones are not always so obvious. For example, during an exam, many students begin answering questions as soon as they've got the test in their hand. At first that may sound like a pretty good plan. After all, a typical exam has a time limit, and so it would seem to make sense to begin working on it right away. Actually this plan is a bad idea. Although it might seem as though you are wasting precious time, you should read the exam directions, look over all the questions, and even come up with a time plan before you write down a single answer. The first plan is fast but reckless, whereas the second is steady and dependable. Now you have a more structured and efficient approach to test-taking. When you use a systematic plan of this type, you will usually gain more benefits than you would from a plan that seems to be best at the outset.

Shouldn't It Be Easy to Know When You've Used Logical Thinking in Drawing Up Your Plan?

No! Logical thinking is neither easy nor certain. For example, it seemed very logical for commercial airlines to take the “Mediterranean route” when flying from Amsterdam to Tokyo. The plan made sense. Navigators felt that the shortest way to go to the Far East was to fly in an easterly direction. But after further investigation, they discovered an even better path. Now flights from Amsterdam take the “polar route.” Instead of heading east, they fly over the North Pole to Alaska, and then west to Tokyo—for a savings of roughly 1,500 miles!

The lesson to draw from that example is this: After you've decided on a goal, work vigorously to accomplish it, but in the meantime let your mind dart off in different directions to see how you might achieve the goal more efficiently, perhaps from a different angle.

Is There a Single Plan That Will Work for Every Goal?

No plan works for every goal

No plan will work for every goal, and only a handful of plans are flexible enough to work for several goals. The secret is to find the right plan to match the goal you have in mind. Using the wrong plan can be inefficient and sometimes even comical. Perhaps you remember the old story of the boy who followed his mother's directions exactly, irrespective of circumstances, when sent to market to buy a lamb. His mother directed him to carry the lamb back on his shoulder. She meant, of course, a lamb already slaughtered. Instead, the boy bought a live lamb at a bargain price, and true to his mother's directions, he carried it back home on his shoulder rather than leading it back on a leash. Although his mother's plan was a good one, it would work only when used in the right circumstance. The same idea applies to your study plans. For example, if you are studying your textbook, putting your notes in your own words and in complete sentences is normally an excellent plan. But if you used the same plan for taking lecture notes, you'd move so slowly that you'd miss most of what the speaker said.

Which Plan is best???

What Are the Best Plans for Your Own Personal Goal?

Good plans may not work for every goal. In the same way, systems that work for most people may not work for you. That's why the best way to come up with a plan for success is to balance wise advice with your own personal experience. This book is full of plans for success and tricks of the trade.

All these systems have been proven to work, and most of them will work for you. You can decide which systems work and which do not through trial and error—in other words, from your own personal experience.

Is a Good Plan Guaranteed to Work?

Even the best plans won't work all the time, so you and your plan should have some built-in flexibility. Flexible plans are specific without being too detailed. Students who plan their days right down to the second are on a collision course for almost certain failure. It pays to allow a little extra "breathing room" in case things don't go as smoothly as you had hoped.

In addition to making your plans flexible, you should try to be a little flexible yourself. When things go wrong, don't give up. Adjust and keep on going.

DON'T GIVE UP!!!

TAKING ACTION

Action = spark

What Is Action?

Goals and plans won't do you any good unless you take some action. Action is the spark that brings your goal and plan to life. Without action, goals and plans are pointless. You can decide you want to finish a book, and you can even plan the pages that you need to read each day, but until you actually start reading, all your preparations will be pointless. In the same way, the United States' goal to reach the moon and the plans for the spacecraft were both impressive, but they didn't come to life until the first rocket left the launch pad and headed into space.

What Prevents People from Taking Action?

Once you do have a goal and a plan, that's no guarantee that you will take action. Procrastination is what stops many people from taking action. It is the tendency to put things off, to write that paper the night before it is due, to cram for a test instead of studying for it right from the start. Although procrastination is just one of many common bad habits, it may be the single greatest obstacle to success. It is also, as we'll see in Chapter 3, a prime source of tension. ???

What Causes Procrastination?

Experts on procrastination can find no single cause for this roadblock to success. Sometimes it is prompted by a fear of failure; at other times, as strange as it may seem, it can be brought on by a fear of success. Other factors such as family responsibilities as well as personal triumphs and tragedies can contribute to a habit of procrastination. Although the experts can't pin down a single cause of procrastination, most agree that procrastination is a compulsion: once you begin procrastinating, it's easy to continue. But like any other bad habit, the self-destructive circle of procrastination can be broken.

Procrastination
(fear of failure
fear of success
tragedy) compulsion

CONFRONTING PROCRASTINATION

Negative excuse

My effort might not be good enough.

There's a good program on TV tonight.
I'll do my work later.

I don't have the right materials to get
the job done.

Positive response

I realize that it won't be perfect, but if
I start right now, I'll have time to make
some changes.

I've still got some time until the show
starts. I can squeeze in some work before
then.

I know I don't have everything I need,
but I'll see how much I can accomplish
with the materials I do have.

THE GPA OF SUCCESS

GOAL—should reflect your wants and needs. Make it large and ambitious without
being vague. Write it down!

PLAN—lists the route you plan to take in order to reach your goal. It should be
efficient and specific. Good advice and personal experience combine to create
the most effective plans.

ACTION—brings your goal and your plan to life. Requires confidence, self-discipline,
and a power over procrastination.

Preventing the "P" = a goal & a plan & aim

How Can You Prevent Procrastination?

The first step in fighting procrastination is to develop a goal and a plan. If you do have a goal and a plan but you're still procrastinating, you should take aim at the excuses you have given for not getting your work done. Dream up reasons why you can instead of why you can't. That will often be all it takes to pull yourself out of the vicious circle of inactivity and low self-esteem and put yourself on the road to progress and success.

This chapter would not be complete without more wisdom from Norman Vincent Peale, who tells about the vital importance of *taking action*—taking action throughout the entire process of personal goal setting.

I suggest that you write down what you want to do with your life. Until you write a goal, it is only a wish; written, it becomes a focused objective. Put it

Reasons why you can't procrastinate

down on paper. When it is on paper, boil it down to a single sentence: what you want to do, exactly when you intend to start (which should be right now), exactly when you plan to achieve your goal. Nothing fuzzy or hazy. Everything sharp and clear and definite. No reservations or qualifications. Just one strong, simple, declarative sentence. . . . I want you to make half a dozen copies of that sentence and put them where you'll see them at least three times a day. I want that pledge to sink down through all the levels of your conscious mind and deep into your unconscious mind, because that is where it will unlock the energies that you will need to achieve your goal.

If setting worthy goals is the first step on the road to success, the second is the belief—the conviction that you are capable of achieving those goals. There has to be in your mind the unshakable image of yourself *succeeding* at the goal you have set yourself. The more vivid this image is, the most obtainable the goal becomes.

Great athletes have always known this. The high jumper “sees” himself skimming over the bar; the place-kicker in football keeps his head down as he kicks, but in his mind’s eye he holds the mental picture of what he wants to happen in the next few seconds. . . . The more intensely he images this before it happens, the higher his confidence in himself and the better his chances of making it happen.¹¹

I hope that by now you are ready to pick up your pencil and begin writing your goal or goals. The following format-examples and four sequential steps are designed to help you in this thinking-writing process.

Step 1. On a clean sheet of $8\frac{1}{2} \times 11$ paper, brainstorm about your goals. Jot down possible goals and words about them that come to mind, and do so quickly and freely. Use brainstorming as an opportunity to explore any aspects of any goals you choose. Do not stop writing to correct your spelling, polish a phrase, reorganize your notes, or analyze a thought. Just keep going until you’ve jotted down all that you can think of about your possible goals. Now look over your notes and group together similar items. Formulate each group into a goal by writing a summarizing sentence that states the main idea of each group. Select any one of these goals, and write it in your own $8\frac{1}{2} \times 11$ version of block 1 of Figure 1.1.

Step 2. On a separate sheet of paper, list in chronological order the steps you’ll need to take to reach one of your goals. Transfer this list to your own block 2.

Step 3. On another sheet, jot down those academic and personal strengths that will help you achieve this goal. List them in your own block 3.

Step 4. Identify any academic weaknesses (such as difficulty with writing papers) or personal obstacles (such as financial, family, or

¹¹From Norman Vincent Peale, *Positive Imaging*. Copyright © 1982. Published by Fleming H. Revell, a division of Baker Book House. Reprinted with permission.

1	2
<p>My Goal</p> <p><u>Dance</u></p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Steps Leading to My Goal</p> <p>1. <u>Discipline</u></p> <p>2. <u>Dancing</u></p> <p>3. <u>Stretching</u></p> <p>4. <u>Eating habits</u></p> <p>5. <u>Sleep</u></p> <p>6. <u>studying</u></p> <p>7. <u>imagining</u></p>
<p>3</p> <p>Positive Factors</p> <p>1. <u>talent</u></p> <p>2. <u>teachers</u></p> <p>3. <u>choreography</u></p> <p>4. <u>the story</u></p> <p>5. <u>freedom to express</u></p> <p>6. _____</p> <p>7. _____</p>	<p>4</p> <p>Obstacles</p> <p>1. <u>Sleep</u></p> <p>2. <u>eating habits</u></p> <p>3. <u>procrastination</u></p> <p>4. _____</p> <p>5. _____</p> <p>6. _____</p> <p>7. _____</p>

FIGURE 1.1 Shaping Your Future

health problems) that you will have to overcome to reach this goal, and list them in your own block 4. Repeat steps 2 to 4 for each goal you wrote in step 1.

With the completed Shaping Your Future sheets in hand, expand your resources. Talk with your academic adviser or with a counselor in your school's career center. Don't underestimate the value of discussing your goals and your plans for achieving them. Get as much feedback as you can. Then, if necessary, modify your goals and plans into realistic, attainable maps for your future.

Shape
your
future

Date _____
 Book _____
 Starting page _____
 Ending page _____
 No. of pages _____
 Time allotment _____
 Time started _____
 Time to finish _____
 Time finished _____
 Page reached _____
 Goal achieved yes—no
 Reason (if no) _____

 No. of min. worked _____
 No. of pages read _____
 Atmosphere: interruptions
 no interruptions
 Work location _____

FIGURE 1.2 Reading Assignment Card. *Source: Scott Solomon, Department of Neurology, College of Physicians & Surgeons of Columbia University, New York, NY.*

You can also develop plans to achieve short-term goals such as completing textbook assignments. After writing out his academic goals, one college student enthusiastically said, "I now do almost everything in terms of goals, even my textbook assignments. I feel I'm in control of every day."

He then gave me a copy of a card that keeps him focused on his assignments (Figure 1.2). "Using this card," he explained, "I waste no time. I comprehend better and remember more."

With this format as a guide, you can design your own Reading Assignment Card. Try it, refine it if necessary, and then reproduce the final version so you'll have a ready stack.

By getting into the goal-setting mode, you can put yourself in control not only of your academic life but also of your life after college.

A FEW THOUGHTS ABOUT VOCABULARY

At the end of each chapter, you'll find the last page or two devoted to vocabulary building. There you'll find words pictorially presented in a way that is both highly interesting and incisively memorable. For example, the history of the word *tantalize* is portrayed by King Tantalus up to his chin in a pool of water. The water recedes just out of reach of his parched lips as he bends to quench his extreme thirst. His extreme hunger is not satisfied either. The fruit on a branch just over his head slowly rises just out of reach as his fingers extend to grasp a succulent piece. Although he is in Hades because of his crimes, one cannot but feel sorry for his torturous predicament.

The picture makes a memorable mental impression that the word *tantalize* means "to excite (another) by exposing something desirable while keeping it out of reach." The Chinese adage that "a picture is worth a thousand words" proves itself again.

In addition to the illustrations, there are "Words in Context." These are insightful quotations that can be applied to corporate life. You are asked to select from three options the word that most nearly reflects the meaning of the italicized word. This is not a test; rather, the purpose is to expose you to words. You may select unfamiliar words for further study. Familiar words will provide reinforcement for your existing vocabulary.

May I finally suggest that you peruse the vocabulary chapter (Chapter 6), which will fully set the stage for getting the maximum from these end-of-chapter exercises.

SUMMARY

In regard to goals, what does GPA stand for?

"G" stands for Goal, "P" for Plan, and "A" for Action. All three are necessary for success.

What's the primary purpose of a goal?

Its purpose is to keep your thinking and your actions focused.

Do smaller intermediary goals get in the way of the primary goal?

No. Achieving small goals on the way to the primary goal is like being a marathon runner who makes the first mile on time, then the second mile, and so forth.

Is it dangerous to set a goal that's too ambitious?

No. You can always downsize your goal and the effort made is not wasted. You'll be further ahead than if you had worked originally for a much lesser goal. Best of all, you never know your full potential unless

What is the effect of “imaging” as set forth by Norman Vincent Peale?

you shoot for the stars. Don’t sell yourself short.

According to Norman Vincent Peale, the visualizing and imaging of your goal permeates your entire mind and body, thus releasing powerful internal energy that almost guarantees the successful attainment of your goal.

What is the most common fault that dooms the attainment of many goals?

Without question, it’s procrastination. Procrastinators are always going to start tomorrow, once they get the small tasks out of the way, and there are a multitude of other excuses.

What’s the main advice for achieving your goal set forth by Norman Vincent Peale?

He says, in effect, “Write it on paper in one concise, clear sentence. Then, keep it before you so you’ll roll out of bed early, attend classes eagerly, do your homework energetically, always with that goal, like a moving picture, plainly in your mind.”

How does goal setting affect a person psychologically?

Very favorably. It gives you a sense of control over your life. Goals also prevent you from drifting into situations, then finding yourself at the mercy of circumstances. Goals help you to develop a sense of inner peace, which gives you physical and mental poise.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Having a goal constantly in mind usually keeps you focused .
tensed hurried focused
2. Goals should be looked upon as destinations .
routes destinations motivations

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|--------------------------------|---|
| <u>c</u> 1. Imaging | a. Remains fuzzy and hazy |
| <u>f</u> 2. GPA | b. Deals with short-term items |
| <u>c</u> 3. Minor goal | c. Usually begins with brainstorming |
| <u>h</u> 4. Procrastination | d. Provides a good sounding board |
| <u>e</u> 5. Unwritten goal | e. Consists of vividly picturing a desired goal |
| <u>a</u> 6. Deciding on a goal | f. Stands for goal, plan, and action |
| <u>g</u> 7. Academic adviser | g. Are usually career goals |
| <u>d</u> 8. Primary goals | h. Means finding ways to delay getting started |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- T 1. Imaging by itself can lead one to achieve goals successfully.
- F 2. Once a goal has been set, action follows almost naturally and automatically.
- T 3. Smaller goals are necessary on the way to a major goal.
- F 4. Choosing a goal is always an agonizing decision.
- F 5. Good career goals can be health, happiness, and security.
- F 6. Aiming high can often be a mistake.
- T 7. A short-term goal takes into consideration the expenditure of time and energy needed to achieve it.
- F 8. The original goal, once set, should not be modified.
- T 9. It is easy to kick the habit of procrastination.
- T 10. Writing down what you want to do with your life is a sound way to establish your major goal.

Multiple choice. Choose the phrase that completes each following sentence most accurately, and circle the letter that precedes it.

- The overriding objective in choosing a goal should be the
 - satisfaction in attaining it.
 - professional esteem in which it is held.
 - personal interest in it.
 - monetary rewards it brings.
- The meaning of the quotation "Stupidity is sticking to your guns when you're firing blanks" is:

- a. Stick to your goal no matter what happens.
- b. Work even harder to achieve your goal successfully.
- c. Don't let a few failures discourage you.
- d. Change or modify your goal if it isn't working out right.

Short answer. Supply a brief answer for each of the following items.

1. Explain how Norman Vincent Peale's "powerful and mysterious force in human nature" is brought about.
2. Discuss the role of minor goals.
3. Describe one way in which you would go about overcoming the habit of procrastination.

THE WORD HISTORY SYSTEM

tantalize TAN'-ta-lize' v. To excite (another) by exposing something desirable while keeping it out of reach.

Tantalize: *to torment with the punishment of Tantalus*



In Greek mythology, King Tantalus offended the gods and was punished in an extraordinary manner. He was placed in the midst of a lake whose waters reached his chin but receded whenever he attempted to allay his thirst. Over his head hung branches laden with choice fruit, which likewise receded whenever he stretched out his hand to satisfy his hunger. Tantalus became the symbol of such teasing, and his name is the root of our verb *tantalize*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Nothing in the world can take the place of *persistence*. *Talent* will not; nothing is more common than unsuccessful men of talent. *Genius* will not; unrewarded genius is almost a byword. Education will not; the world is full of educated *derelicts*. The slogan "Press on" has solved and always will solve the problems of the human race.

—Calvin Coolidge (1872–1933), thirtieth president of the United States

- | | | | |
|--------------------------------|---------------|-------------|--------------|
| 1. place of <i>persistence</i> | perseverance | principles | mottoes |
| 2. <i>talent</i> will not | nobility | tradition | natural gift |
| 3. <i>genius</i> will not | high aptitude | distinction | status |
| 4. educated <i>derelicts</i> | snobs | vagrants | tycoons |

Don't be afraid to take a big step. You can't cross a *chasm* in two small jumps.

—David Lloyd George (1863–1945), British statesman and prime minister

- | | | | |
|-------------------------|-------|-------|------|
| 5. cross a <i>chasm</i> | river | gorge | peak |
|-------------------------|-------|-------|------|

Call it what you will. *Incentives* are the only way to make people work harder.

—Nikita Krushchev (1894–1971), Soviet premier

- | | | | |
|---|---------|--------|------------|
| 6. <i>incentives</i> . . . make
people work harder | rewards | praise | punishment |
|---|---------|--------|------------|

MANAGING YOUR TIME

Perhaps the most valuable result of all education is the ability to make yourself do the thing you have to do, when it ought to be done, whether you like it or not.

—THOMAS HUXLEY (1825–1895), ENGLISH BIOLOGIST

Time flies, but that's no reason for you to go through each day simply "winging it." Through conscientious use of time and common-sense planning, you can make the most of your day. This chapter ticks off the important elements of time management, including:

- Saving time
- Using a master schedule
- Using a weekly schedule
- Using a daily schedule
- Using a task-based schedule
- Using a weekly schedule based on assignments
- Using a things-to-do list

MANAGING YOUR TIME

Using Time Schedules

Adapt Your Schedules

Use the Three-Part Scheduling Plan

Saving Time

Make the Most of "Hidden" Time

Change Your Time Habits

Time is a precious and irreplaceable commodity. Few have noted that fact more convincingly and succinctly than Queen Elizabeth I of England (1533–1603). As she lay dying, she wished, “All my possessions for a moment of time.”

How you use time can determine your success or failure in college. If you use time wisely, you’ll prosper. If you use it poorly, you’ll fail in the job you came to do. That’s why the management of time is the number-one skill to master in college.

Yet students frequently squander time. A survey conducted at Fordham University in 1987 found that college freshmen spent roughly one-third of their waking hours during a typical weekday engaged in social activities or idle leisure. This “free time” amounted to nearly twice the time the students spent studying. And on the weekend the ratio of social and idle leisure time to study time for the same group was almost six to one!

Although the students in the survey seemed to waste time routinely, you needn’t put yourself in the same position. You can gain extra time in two ways: (1) by doing a job in less time than usual and (2) by using small blocks of time that you usually waste. The first way requires you to study more efficiently, and this book provides a great many techniques to help you do just that. The second way requires you to save time by changing your habits and making the most of “hidden” time, and to manage your time by using a three-part scheduling plan. This chapter offers a number of suggestions that can enable you to use time more productively.

Managing Time

SAVING TIME

All of us have claimed that we don’t have enough time to accomplish what we need to do. But the fact is that everyone is allotted the same amount of time: twenty-four hours a day. It’s our day-to-day habits, activities we no longer notice, that save time or waste it. You can put your time to better use by eliminating the bad habits that waste time, cultivating good habits that save time, and pinpointing areas of “hidden” time.

A good way to begin is by keeping a daily activities log. From the time you wake up to the time you go to sleep, note all your major activities, the time you started and finished each, and the time each activity consumed. With your day itemized on paper in this way, you can gain a clearer picture of where your time is being spent and where it’s being wasted. The activities log in Figure 2.1 shows one student’s daily routine and how he decided to put his time to better use.

Time		Time Used	Activity - Description	
Start	End			
7:45	8:15	:30	Dress	←
8:15	8:40	:25	Breakfast	
8:40	9:00	:20	Nothing	←
9:00	10:00	1:00	Psychology - Lecture	
10:00	10:40	:40	Coffee - Talking	←
10:40	11:00	:20	Nothing	←
11:00	12:00	1:00	Economics - Lecture	
12:00	12:45	:45	Lunch	
12:45	2:00	1:15	Reading - Magazine	←
2:00	4:00	2:00	Biology Lab	
4:00	8:00	4:00	Work (includes 1/2 hour dinner break)	
8:00	8:50	:50	Study - Statistics	
8:50	9:20	:30	Break	←
9:20	10:00	:40	Study - Statistics	
10:00	10:50	:50	Chat with Bob	←
10:50	11:30	:40	Study - Accounting	←
11:30	11:45	:15	Ready for bed	←
11:45	7:45	8:00	Sleep	

Paste 3 x 5 cards on mirror: laws of economics; psychological terms; statistical formulas. Study while brushing teeth, etc.

Look over textbook assignment and previous lecture notes to establish continuity for today's psychology lecture.

Break too long and too soon after breakfast. Work on psychology notes just taken; also look over economics assignment.

Rework the lecture notes on economics while still fresh in mind. Also, look over biology assignment to recall the objectives of the coming lab.

Break is too long.

Good as a reward if basic work is done.

Insufficient time allotted, but better than no time.

While brushing teeth, study the 3 x 5 cards. Replace cards that have been mastered with new ones.

FIGURE 2.1 Record of One Day's Activities and Suggestions for Making Better Use of Time

Change Your Time Habits

Once you have the concrete evidence of a daily activities log before you, you can see where to save time. The way to begin doing so is to eliminate common time-wasting habits and to develop time-saving habits.

Defy Parkinson's Law Parkinson's Law says that work expands to fit the time allotted.¹ To avoid running out of time, work Parkinson's Law in

¹C. Parkinson, *Parkinson, the Law* (Boston: Houghton Mifflin, 1980).

reverse: For each task, set a deadline that will be difficult to meet, and then strive to meet that deadline.

Each time you achieve your goal, reward yourself with some small but pleasant activity. Take a break. Chat with a friend. Stroll around the room. Have a special snack, such as a bag of peanuts (keep it in your desk, to be opened only as a reward).

If you fail to meet a deadline, don't punish yourself. Just hold back your reward and set another goal. It is *positive* reinforcement that is powerful in effecting a change in behavior.

Obey Your Alarm Clock How many times do you hit the snooze button on your alarm clock before you finally get out of bed? Even one is too many. Set your alarm for the time you want to get up, not for the time you want to *start* getting up. If you can't obey your alarm, you'll have a hard time sticking to your time schedule. After all, it doesn't even buzz.

Take "Time Out" Reward yourself with regular short breaks as you work. Learning in several small sessions, rather than in one continuous stretch, actually increases comprehension. In one study, students who practiced French vocabulary in three discrete sessions did 35 percent better on an exam than those who tried to learn the words in one sitting.² So take a breather for ten minutes every hour, or spend five minutes resting every half-hour. Whichever method you choose, keep your breaks consistent. This way, you'll study with more energy and look forward to your regular rests. And when you return to your desk, you'll find that you feel more refreshed.

Jot Down Thoughts on a Notepad Keep a memo pad or a plain sheet of paper by your side, and write down any obligations or stray ideas that occur to you as you're studying. By putting them on paper, you'll free your brain to focus entirely on the task before you. You will work more efficiently, and as a result you'll save time.

If the thoughts you've written down don't relate to your studies, you can deal with them when your work is done or even while you're taking a break. If your jottings do relate to your work, you can use them to get the jump on the subject they pertain to. Often the hardest part of shifting from one activity to another is just getting started. Your jottings may provide an impetus to overcome the inertia that seems to characterize the outset of a new activity. If so, they may save you some valuable time. Here is an example from the notepad of one student who, while working on a calculus

²Kristine C. Bloom et al., "Effects of Massed and Distributed Practice on the Learning and Retention of Second-Language Vocabulary," *Journal of Educational Research* 74, no. 4 (March–April 1981): 245–248.

assignment, came up with a topic for an upcoming paper. As soon as she finished her calculus, she was able to begin doing preliminary research on the topic without delay.

Call Mr. Soames about make-up test.

Check Campbell book for discussion of brain laterality.

What about "Earthquake Prediction" as possible paper topic?

Look up definitions for leftover vocabulary cards.

Tennis at 6 tonight, not 7!

Good Ideas

Make the Most of "Hidden" Time

Another way you can gain time is by tapping into "hidden time" that goes unused because you don't recognize it as being available.

Carry Pocket Work Many situations may leave you with a few moments of unexpected free time—a long line at the bank or supermarket, a delayed bus or train, a wait at the doctor's office, a lunch date who arrives late. If you make a point to bring along a book, a photocopied article, or 3×5 cards carrying key concepts or formulas, you'll be able to take advantage of otherwise frustrating experiences.

Use Your Mind When It's Free Some activities may afford overlooked opportunity for studying if you're prepared. For example, if you're shaving, combing your hair, or washing dishes, there's no reason you can't be studying at the same time. Attach small metal or plastic clips near mirrors and on walls at eye level. Place a note card in each clip. Or do a problem or two in math or master some new vocabulary words as you eat a sandwich at work.

Put Information on Audiocassettes Another way of using hidden time is by listening to information you've recorded on audiocassettes. Recorded information enables you to keep studying in situations where you're moving about or your eyes are otherwise occupied, such as when you're getting dressed or driving. In addition, recorded information can provide a refreshing change from written material.

Employ Spare-Time Thinking You can make the most of the moments immediately before or after class by recalling the main points from the last lecture as you're heading to class or by quickly recalling the points of a lecture just completed as you're leaving class.

Use Your Subconscious At one time or another, you have awakened during the night with a bright idea or a solution to a problem that you had been thinking about before bedtime. Your subconscious works while your conscious mind is resting in sleep. If you want to capture the ideas or solutions produced by your subconscious, write them down as soon as you wake up; otherwise, they'll be lost. Many creative people know this and keep a pad and pencil near their beds. For example, Nobel Prize winner Albert Szent-Györgyi said, "I go to sleep thinking about my problems all the time, and my brain must continue to think about them when I sleep because I wake up, sometimes in the middle of the night, with answers to questions that have been eluding me all day."³

*write what
them done*

USING TIME SCHEDULES

A time schedule is a game plan, a written strategy that spells out exactly what you hope to accomplish—for a day, a week, or even the entire term—and how you plan to do it. Committing yourself to planning and keeping to a schedule can seem a bit frightening at first, but following such a schedule soon becomes a source of strength and a boon to your life. There are several benefits to a schedule.

A schedule provides greater control. A thoughtfully constructed time schedule can increase your sense of control in four ways. First, because your schedule is written down, your plans seem more manageable. You can start working without delay. Second, you know you'll study all your subjects—even those you dislike—because you've allotted time for them in your schedule. There's less of a temptation to skip disliked subjects when study time has already been allotted for them in your schedule. Third, a schedule discourages you from being lazy. You've got a plan right in front of you, and that plan says, "Let's get down to business!" Fourth, you can schedule review sessions right from the start and avoid last-minute cramming for tests.

A schedule encourages relaxation. At the same time, because your plan is written down instead of floating around in your head, your mind is freed for other things. There's no time wasted worrying about what to do next. It's all there on paper. There's no guilt either. Both work and play are written into

³Originally published in *Some Watch While Some Must Sleep*, by William C. Dement, as a volume in The Portable Stanford series published by the Stanford Alumni Association. Copyright © 1972. Reprinted by permission of the Stanford Alumni Association.

Why? Take a break?
Feel Guilty?

your schedule. This means that when you take a break, you know you deserve it.

Despite these benefits, many students are reluctant to start using a time schedule. They feel not only that a schedule will do them little good but also that keeping track of time will turn them into nervous wrecks. Neither worry is warranted.

A schedule saves time. Yes, it takes time to devise a schedule, but that time is rewarded. You will be able to shift smoothly from one activity to another, without wondering what to do next.

A schedule provides freedom. Scheduling frees you from time's control. The people you see dashing from class to library to gym, or eating lunch on the run, are slaves to time. The students who schedule time, who decide how it will be used, are the masters of time.

A schedule increases flexibility. Disorganized people often waste so much time that there's no room for flexibility. People who do scheduling free their time for a variety of activities and are therefore more flexible.

Use the Three-Part Scheduling Plan

If you're attending classes full time, your best strategy for scheduling is to use a three-part plan. The three schedules—a *master schedule*, a *weekly schedule*, and a *daily schedule*—work in concert to help you manage each day as well as the term as a whole. If you are balancing your studies with the extra responsibilities that come with working at a job, participating in a time-consuming extracurricular activity, or raising a family, the basic principles that underlie the plan are still valuable, but you may want to tailor them to your particular needs.

The three-part scheduling plan provides a system for handling the assignments and activities that make up your daily life. The master schedule serves as a basic structure for organizing your activities, the weekly schedule adds specific details to the master schedule, and the daily schedule puts the weekly schedule in a portable form. Although each schedule performs a different function, all three follow the same scheduling guidelines:

1. *Plan your time in blocks.* A father once tied a bundle of small, thin sticks together with a strand of twine, handed the bundle to his youngest son, and said, "Son, break these sticks in half." The boy used his hands and knees but could not break the bundle. Sadly, he handed it back to his fa-

1. Master
2. Weekly
3. Daily

Blocks

ther. Without a word, the father untied the twine, and using only his fingers, snapped each stick one by one.

When the sum total of your obligations and academic assignments seems overwhelming, it helps immensely to split them up into small, manageable units. By dividing each day into blocks, time schedules provide you with a method for breaking up your responsibilities and dealing with them one by one. Assigning a block of time to each activity ensures that you will work at peak efficiency.

When you're faced with an assignment, particularly a long-term one, remind yourself right from the start that you do not intend to accomplish everything in one sitting. The "divide and conquer" tactic applies to academic assignments just as it does to military campaigns.

2. *Don't waste big blocks.* There's a strong tendency to say, "I'm going to clean up the several little assignments so that I can devote uninterrupted time to a big assignment." This is a poor decision. Instead, save these small assignments for the little slivers of time.

3. *Study during prime time.* For most of us, prime time is daytime. In fact, research has shown that each hour used for study during the day is equal to one and a half hours at night. Even so, you may find that you have dead hours during the day when you are less productive than you'd like to be. Schedule less demanding tasks for these hours. STUDY DURING DAYTIME

4. *Study before recitation classes and after lecture classes.* A study session before a recitation or discussion class (a foreign language course or a psychology seminar, for example) helps warm you up. When you walk into class, the material is fresh in your mind. For lecture classes, use the time immediately after class to fill in any gaps in your notes and to review the information you've just learned.

5. *Schedule your time effectively.* Account for all your time, but do so without being overly detailed. The time you'd take to make an overly meticulous schedule can be better used in studying a subject directly, and the chances of your following such a plan are slim.

*6. *Include nonacademic activities.* Always set aside time for food, sleep, and recreation as well as the other activities of your life. Cheating yourself out of a meal, a good night's sleep, a swim, a family get-together, or a meeting with friends won't save you time in the long run. In fact, this may cost you time because all these activities are necessary for your overall mental and physical wellness. Make your plan for living, not just for studying.

Biological Considerations⁴ We're all subject to circadian rhythms; that is, we're sleepiest a few hours before dawn and again, twelve hours

⁴This section is based on Edward Dolnick, "Snap Out of It," *Health* (February/March 1992).

later, in mid-afternoon. Further in keeping with the body's natural cycles, we're also widest awake and most alert about every twelve hours; that is, every mid-morning and mid-evening.

The danger zone—the danger of falling asleep—for both students and automobile drivers is in the middle of the afternoon. By being aware of circadian rhythms, students can adjust their schedules accordingly: Schedule reading, writing, and problem solving for mornings and evenings but active behavior, such as lab courses and work, field work, and personal exercise, for afternoons. If you are not a heavy coffee drinker, then a cup of coffee might get you through the afternoon slump.

It's tempting to sleep almost to noon on Saturday and Sunday—but don't do it. You'll throw off your biological rhythm and bring jet lag upon yourself. You'll pay the price on Monday morning, and perhaps even on Tuesday and Wednesday. Instead of being alert in the morning, you'll be drowsy and slow. Why? You need the bright light of the early morning to keep your circadian clock in phase.

Psychologists have made other rather interesting discoveries about behavior. Short-term memory, for example, is at its peak at about nine o'clock in the morning. So, do textbook reading—underlining and making notes in the margins—around this time. But review those underlinings and margin notes around three o'clock in the afternoon, when long-term memory is at its peak.

Experiments have consistently found that problem-solving skills peak in the morning, then gradually diminish during the afternoon and evening. However, overall alertness—that is, reaction time—improves continuously throughout the entire day, peaking in the evening. This explains why even during the sleepest part of the mid-afternoon, people can play tennis as well as ever, surgeons can operate perfectly well, and pilots can land their planes as usual—all because these are active behaviors. But reading a textbook during the afternoon just won't keep the adrenaline flowing. So, do all your creative work in the morning.

Lay a Foundation with a Master Schedule A master schedule provides a schedule of fixed activities around which your varying activities are arranged. Unless changes occur in your basic program, you need to draw up a master schedule only once per term.

A master schedule grid lists the days of the week at the top and the hours of the day down the left side. The boxes within the grid are filled in with all your required activities: sleep, meals, job, regular meetings, community activities, sports, and, of course, classes. The empty boxes that remain represent your free time. Figure 2.2 provides an example of a typical master schedule.

Such a master schedule, on a 5×8 card taped over your desk or carried in your notebook, unclutters your mind. More important, it enables you to visualize the blank boxes as actual blocks of time into which you can fit necessary activities.

Account for Changing Details with a Weekly Schedule The weekly schedule takes over where the master schedule leaves off. To construct it, photocopy your master schedule and then fill in the empty blocks with the activities you have planned for the upcoming week. If you have a math test on Friday, for example, you will need to schedule a little extra study time for math. Next week you may be assigned a research paper. If so, you'll probably want to leave space in your schedule for library or Internet research. The weekly schedule helps you adapt your time to your changing priorities. Keep it posted by your desk or pasted on the inside cover of your notebook.

A sample weekly schedule is shown in Figure 2.3. The lists that follow show how the guidelines for scheduling were used to set it up.

Monday Through Friday/Saturday

- 7–8 A.M. Avoid the frantic dash and the gobbled (or skipped) breakfast by getting up on time.
- 12–1 P.M. Take a full, leisurely hour for lunch.
- 5–6 Relax before dinner—your reward for a day of conscientious work.
- 7–9 Keep up with current notes and assignments through systematic studying.
- 9–10 To forestall cramming at quiz and examination times, give some time every day to a review of previous assignments and ground covered to date.
- 10 A cease-study time of 10 P.M. provides an incentive for working hard during the day and early evening.
- 10–12 Devote some time every day to reading books that truly interest you. Recreational reading and conversation help you unwind for a good night's sleep.

Tuesday/Thursday/Saturday

- 8–9 A.M. Because chemistry (10–11) is your hard subject, build your morning study program around it. An hour's study before class will make the class period more meaningful.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
7-8	← Dress and Breakfast →						
8-9	Bio-Sc		Bio-Sc		Bio-Sc	Dress & Breakfast	
9-10		P.E.		P.E.		P.E.	Dress & Breakfast
10-11	History		History		History		
11-12		Spanish		Spanish		Spanish	
12-1	← Lunch →						
1-2	Math	Computer Lab.	Math	Computer Lab.	Math		
2-3	English		English		English		
3-4		Work-study Prog.		Work-study Prog.			
4-5	Work-study		Work-study		Work-study		
5-6							
6-7	← Dinner →						
7-8							
8-9							
9-10							
10-11							
11-12	← Sleep →						

FIGURE 2.2 A Master Schedule with Work

Time	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
7-8			Dress and Breakfast				Religious Service, Recreation, Conversation, Recreational Reading
8-9	History	Study Chem.	History	Study Chem.	History	Study Chem.	
9-10	Study History	Phys. Ed.	Study History	Phys. Ed.	Study History	Phys. Ed.	
10-11	Study French	Chem.	Study French	Chem.	Study French	Chem.	
11-12	French	Study Chem.	French	Study Chem.	French	Study Chem.	
12-1			Lunch				
1-2	Math	Film-making	Math	Film-making	Math	Recreation, Conversation, Special Projects, Reading, Extra Work on Difficult Subjects Through Review	
2-3	Study Math	Library: Paper	Study Math	↑	Study Math		
3-4	Study English	Library: Paper	Study English	Chem. Lab.	Study English		
4-5	English	Library: Paper	English	↓	English		
5-6			Recreation				
6-7			Dinner				
7-8	Study English	Study Math	Study English	Study Math	Study English	English Paper	
8-9	Study French	Study History	Study French	Study History	Study French	English Paper	
9-10	Review English	Review French	Review History	Review Math	Review Chem.	Study History	
10-11			Recreational Reading				
11-12			Conversation, Sleep				

FIGURE 2.3 A Detailed Weekly Schedule Based on a Master Schedule

11–12 P.M. Another hour's study immediately after chemistry class will help you remember the work covered in class and move more readily to the next assignment.

Special

Tuesday 2–5 P.M., library: paper

Sunday 7–9 P.M., English paper

For some assignments you will need to schedule blocks of time to do research or to develop and follow-up ideas.

Saturday From noon on, Saturday is left unscheduled—for recreation, for special projects to which you must devote a concentrated period of time, for extra work on difficult subjects, for thorough review.

Sunday This is your day until evening. Study history before you go to bed because it is the first class you'll have on Monday morning.

Provide a Portable Game Plan with a Daily Schedule A daily schedule is a brief yet specific list of the day's tasks and the time blocks you plan to accomplish them in. You should be able to fit all this information on a 3×5 index card that you can carry around with you all day. Make up your daily schedule each night before you go to bed. Once you have put your worries and concerns on paper, your mind will be free for sleep. You will also have thought through your day and will be better prepared when the morning comes. Figure 2.4 shows one student's daily schedule and explains why it is effective.

Adapt Your Schedules

If you have a job, a family, or some other commitment that requires a great deal of your attention, the predictable time blocks that characterize traditional time schedules may not be as useful for you. You may need a system that helps you use scattered bits of time instead. And if you are faced with a long-term assignment, your schedules and scheduling strategies may require some adjustment as well.

Develop a Task-Based Master Schedule When Necessary A task-based master schedule enables you to keep track of one or more assignments or goals over an extended period of time. Figure 2.5 provides an example of a task-based master schedule. Across the top of the schedule, instead of the days of the week, list the major goals you hope to accomplish

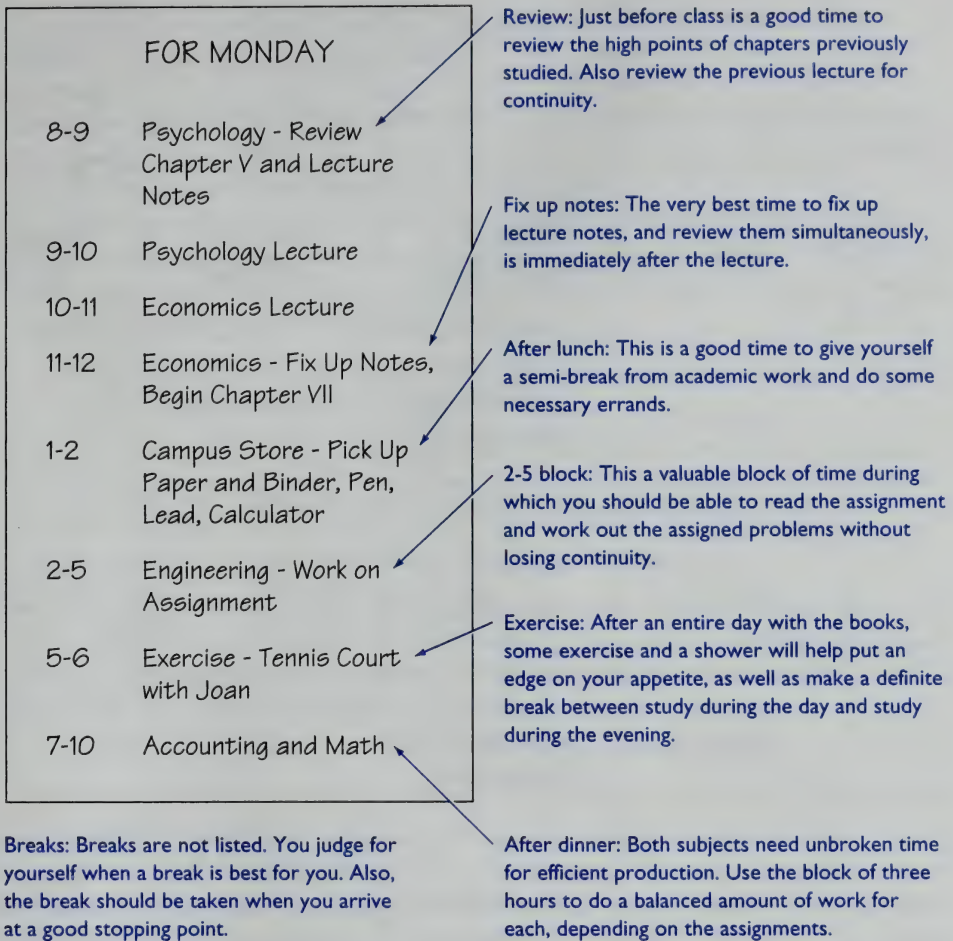


FIGURE 2.4 A Daily Schedule

or the assignments you plan to complete. Deadlines for subgoals may be written down the left-hand side where the hours of the day would normally be written in a standard master schedule.

Now divide up each goal or long-term assignment into manageable subgoals. List these in a column beneath the task they refer to. For example, if you've been assigned a research paper, you may arrive at the following subgoals: Do preliminary research, choose topic, plan outline, conduct research, complete first draft, and revise first draft. As you reach each milestone on the way to completing your assignment, cross it off your schedule.

	Psychology Research Paper April 21	Train for Amateur Triathlon May 1	Self-Paced Computer Course
Feb. 7	Select Three Topic Ideas	Up Minimum to 60 Laps	Complete Ch. 1-3
Feb. 10	Do Preliminary Research	Try Ride Up Satyr Hill	
Feb. 14	Make Final Topic Choice	Run 30 Miles Per Week	Complete Ch. 4-6
Feb. 18	Complete Bibliography		
March 15	Finish First Draft		Mid-term Exam
March 18	Begin Rewriting		
April 21	Paper Due		Final

FIGURE 2.5 A Task-Based Master Schedule

As you do, you provide yourself with visual evidence of and positive feedback for the progress you've made.

Use the Task-Based Principle of Ivy Lee Although the following example pertains to business, you, as a student, can use the Ivy Lee Principle in your academic scheduling to get things done.

Charles Schwab, then chairman of the Bethlehem Steel Company, went to management consultant Ivy Lee with the challenge, "Show me a way to get more things done with my time, and I'll pay you any fee within reason." Lee thought for a while, then said:

- Every *evening* write down the six most important tasks for the next day in order of priority.
- Every *morning* start working on task #1 and continue until you finish it; then start on task #2, and so on. Do this until quitting time and don't be concerned if you have finished only one or two tasks.
- At the end of each day, tear up the list and start over.

When Charles Schwab asked how much he owed for this advice, Ivy Lee told him to use the plan for a few weeks, then send in a check for whatever he thought it was worth.⁵ Three weeks later, Lee received a check for \$25,000, which is equal to about \$250,000 in today's dollars!

Several other efficiency experts have given similar advice:

- Leboeuf says, "*Efficiency* is doing the job right; whereas, *effectiveness* is doing the right job."⁶
- Pareto says that 80 percent of our successes come from 20 percent of our studies; therefore, students should spend more time on high-priority subjects and less time on low-priority subjects.⁷ (More on the Pareto Principle later.)

By using good judgment, you can allot the bulk of your time to getting top-priority tasks done yet be mindful not to ignore other tasks with due dates.

Make Your Weekly Schedule Assignment-Oriented If the span of your goal or assignment is a week or less, you can use an assignment-oriented weekly schedule as a supplement to your master schedule. Figure 2.6 shows such a schedule. The format is simple. Draw a horizontal line to

⁵T. W. Engstrom and R. A. Mackensie, *Managing Your Time* (Grand Rapids, MI: Zondervan, 1967).

⁶M. Leboeuf, *Working Smart: How to Accomplish More in Half the Time* (New York: Warner Books, 1979).

⁷C. Parkinson, *Parkinson, the Law*.

divide an $8\frac{1}{2} \times 11$ sheet of paper in half. In the top half, list your subjects, assignments, estimated study times, and due dates. Then, with the due dates and estimated times as control factors, check your master schedule for your available time. Allocate enough hours to do the job, and write them on the appropriate line on the bottom half of the sheet. Stick to your schedule. As long as you give study hours top priority, your remaining hours will be truly free.

Subject	Assignment	Estimated Time	Date Due	Time Due
Electronics	Chapter V - 32 pp. - Read	2 hr.	Mon. 13 th	8:00
English	Paper to Write	18 hr.	Mon. 20 th	9:00
Math	Problems on pp. 110-111	3 hr.	Tues. 14 th	10:00
Industrial Safety	Make Shop Layouts	8 hr.	Fri. 17 th	11:00
Computer Graphics	Generate Slide Presentation (2-4 slides)	6 hr.	Fri. 17 th	1:00
Electronics	Chapter VI - 40pp. - Read	2 1/2 hr.	Weds. 22 nd	8:00

Day	Assignment	Morning	Afternoon	Evening
Sun.	Electronics - Read Chap V English - Find a Topic			7:30-9:30 9:30-10:30
Mon.	English - Gather Notes Math - Problems		2:00-6:00	7:00-10:00
Tues.	English - Gather Notes Industrial Safety	8:00-10:00	3:00-6:00	7:00-10:00
Wed.	English - First Draft Computer Graphics		2:00-6:00	7:00-10:00
Thurs.	Industrial Safety English - Paper Computer Graphics	8:00-10:00	3:00-6:00	7:00-10:00
Fri.	English - Final Copy Electronics		2:00-6:00	7:00-9:30
Sat.				

FIGURE 2.6 A Weekly Schedule Based on Assignments

If your available time is unpredictable, your daily study schedule should simply be a list of things to do arranged in order of priority on a 3×5 card. In this case, assigning specific times is likely to lead only to frustration.

Figure 2.7 shows a typical daily list. To be successful, you need a sense of urgency about referring to your list and studying whenever an opportunity presents itself. Then cross off the tasks as you complete them.

Use the *Pareto Principle* to help yourself draw up your list. Named after Vilfredo Pareto (1848–1923), an Italian economist and sociologist, the Pareto Principle states that the truly important items in any given group constitute only a small number of the total items in the group. This principle is also known as the *80/20 rule*.⁸

For example, in almost any sales force, 80 percent of the business is brought in by 20 percent of the salespeople. In any committee, 80 percent of the ideas come from 20 percent of the members. In a classroom, 80 percent of the teacher's time is taken up by 20 percent of the students.

In any list of things to do, 80 percent of the importance resides in 20 percent of the list. In a list of ten items, 80 percent of the list's value lies in two items, which constitute 20 percent of the list. Because of the Pareto Principle, in your lists of things to do always put the most important items first. Then, if you accomplish only the first few items, you will have accomplished the most important tasks on the list.

Keep the Pareto Principle in mind whenever you make up a list or a schedule or must decide which subject to study first. Apply the principle by listing first things first.⁸

1. Basic Math - 5 problems to solve 2. Geology - Look over specimens 3. Accounting - definitions
Bread - 2 Eggs - 1 doz. Margarine - 1 lb.

FIGURE 2.7 A Things-to-Do List

⁸Reprinted with the permission of Scribner, a Division of Simon & Schuster, from *Getting Things Done*, Revised and Updated Edition by Edwin C. Bliss. Copyright © 1976, 1991 by Edwin C. Bliss.

TWENTY VALUABLE TIDBITS ON TIME

1. Marketing manager Brendan Carr says, "Flying by the seat of your pants doesn't work. You've got to plan and manage your time. Otherwise, it's just gone."
2. Duke Ellington, the great jazz musician, said, "Without a deadline, I can't finish nothin'."
3. Don't waste time preparing to do something. Do it now. Do it instantly.
4. Plunge right in. Start with the easier tasks. Getting one done makes the next one easier. Build momentum.
5. Let your subconscious mind work for you. For example, write out the title of your term paper, jot down some ideas that occur to you, then file the note away and go about your daily work. In the meantime, your subconscious mind will be working away on your term paper.
6. There are times throughout the day when you are naturally more alert and energetic. Find out when these hours are for you; then save the important work for these blocks of time. Find out your time-energy rhythms.
7. According to the James-Lange theory, you can control your moods. More is accomplished when you are smiling and relaxed. Putting a smile on your face, whether you feel like it or not, directly influences you to be happier. John Steinbeck wrote, "A sad soul can kill you quicker than a germ."
8. The greatest time-saver is *concentration*. Once you start working on an assignment, keep your mind glued to it.
9. Write or type neatly the first time. You save time by not having to rewrite or retype.
10. Use blocks of time. You can easily visualize blocks of time, but it is hard to visualize the minutes on a running clock.
11. Be a contrarian. Go to the library during hours when almost nobody is there. Get into the dining-hall line before the crowd. Get the reserved books before the line forms.
12. The amount of energy that a person can physically generate is about one-tenth of one horsepower. Don't rely on brute strength. Use computers and other technological devices, and think how to do it easier and better.
13. Make decisions wisely by asking, "What are the alternatives?" Make a list of these alternatives, and then put pluses and minuses alongside them. Learn this process. It will save lots of time.
14. Don't try to become an "information junkie." Just make sure that you gain a firm grip on your own field.

15. A lot of time is lost by looking for misplaced notes, books, journals, and reports. Make an unbreakable rule: A place for everything and everything in its place.
16. "Most people," says Anthony Robbins, "would not see an awful movie a second time, yet they play the same bad memories over and over again in their heads."
17. When you're really through studying, spend an extra fifteen minutes studying just an extra bit more.
18. Time tactics confront this question: How can I save time? Time strategy deals with priorities: What do I save time for?
19. A Sanskrit proverb puts everything in proper perspective:
 Today well lived
 Makes every yesterday a dream of happiness
 And every tomorrow a vision of hope
 Look well therefore to this day.
20. Let's end with the wisdom of Richard Leider: "Money spent can be re-earned; but time, however, once spent, it is gone forever! It cannot be re-earned."

SUMMARY

How can you gain time?

find hidden time

You can gain time by changing your habits and by finding hidden time throughout your day.

What time habits can you change?

*alarm clock
 Parkinson's Law
 regular break*

If you defy Parkinson's Law and obey your alarm clock, you can break time-wasting habits and add time to your day. You can save time by taking regular breaks when you study and by jotting down distracting thoughts on a notepad.

How can you take advantage of hidden time?

pocket work

You can carry pocket work to do during unexpected free time, use your mind when it's free, listen to audiocassette versions of your notes, think in your spare time, and draw on your subconscious.

What is the value of using a time schedule?

Plot & manage

A time schedule enables you to plot out and manage your time. Using a time schedule can increase your control over your life, leave you feeling more relaxed, and add to your freedom and flexibility.

How do you choose the right type of schedule?

3-part scheduling plan

If you're attending classes full time, you can use a three-part scheduling plan with

master
weekly
daily

What general guidelines should you follow in making up a master, weekly, or daily schedule?

3 separate time blocks
Before recitation
After lecture

What are the purpose and content of a master schedule?

Basic framework

What is a weekly schedule?

fill in master blank
from week to week

What is a daily schedule?

How can you adapt schedules to your life outside school?

separate master, weekly, and daily schedules. If you have additional demanding commitments, you may want to use schedules that emphasize the tasks you want to accomplish.

All three schedules should be made up of separate time blocks that enable you to tackle your tasks in manageable units. Schedule most of your important activities for daylight hours. For recitation classes, study before the class; for lecture classes, study after class. Schedule your time effectively—list all your tasks, but not in daunting and unrealistic detail. Finally, schedule nonacademic activities (meals, sleep, recreation) as well as those that relate to your schoolwork. Your schedule should serve as a plan for living, not just for studying.

A master schedule provides you with a basic framework for a term's activities. Written on a grid, this schedule includes those obligations that stay the same week in and week out. The blocks that are left blank signify the time you have available for scheduling weekly and daily activities.

A weekly schedule picks up where the master schedule leaves off, filling in the blanks with your daily activities as they vary from week to week.

A daily schedule is a portable game plan, showing your day's schedule on a 3×5 card.

If you have a job, a family, or other time-consuming demands, or if you are faced with a long-term assignment, set up your schedules to emphasize the tasks you need to accomplish instead of the time when you will do them. Devise a special master schedule that focuses on long-term goals. Change your weekly schedule so that it is more assignment-oriented, and turn

What is a task-based master schedule?

your daily schedule into a list of things to accomplish.

A task-based master schedule is a list of the major goals you hope to accomplish and the deadlines you set on the way to reaching those goals.

What is an assignment-oriented weekly schedule?

An assignment-oriented weekly schedule budgets your week's school-related activities. It begins with a list of your upcoming assignments and a time estimate for each and then shows a time block for each.

What is a list of things to do?

A daily list of things to do is an outline in order of priority of what you plan to accomplish.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. To take control of your life, you must take control of your time.
personality principles time
2. How we spend or waste time is largely a matter of procrastination.
habit procrastination priority

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-----------------------------|---|
| <u>g</u> 1. Pocket work | a. Says a task expands to fit the time allotted |
| <u>a</u> 2. Weekly schedule | b. Consumes a large portion of a typical first-year student's weekday |
| <u>d</u> 3. Master schedule | c. Continues working even while you sleep |
| ___ 4. "Free time" | d. Provides a basic structure for organizing the term's activities |
| ___ 5. Pareto Principle | e. Puts your schedule in a portable form |
| <u>e</u> 6. Subconscious | f. Lets you keep track of activities that vary throughout the term |

- h 7. Parkinson's Law g. Supplies study material for unexpected free time
- _____ 8. Daily schedule /h. Explains why the most important items on a list should be completed first

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- T 1. Taking regular breaks wastes valuable time.
- F 2. Free time can often occur unexpectedly.
- _____ 3. The master, weekly, and daily schedules all follow the same basic guidelines.
- F 4. Time schedules can make you feel like a slave to time.
- _____ 5. Scheduling saves time that might otherwise be wasted.
- _____ 6. Most of us work more efficiently in the daytime.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

- The three-part scheduling plan is particularly helpful for
 - working parents.
 - b full-time students.
 - student athletes.
 - none of the above.
- A time schedule functions as a
 - a game plan.
 - computer.
 - punishment.
 - reward.
- All your time should be accounted for, but without too much
 - hesitation.
 - b recreation.
 - detail.
 - interest.
- Energy is increased and efficiency is improved when you
 - a work or study continuously.

- b. take brief but regular breaks while studying.
 - c. do most of your studying at night.
 - d. use only one schedule instead of three.
5. The master schedule provides
- a. an alternative to a weekly schedule.
 - b. an excuse for increased recreation.
 - c. a framework of fixed activities.
 - d. a solution to the problem of hidden time.
6. The best approach to a long-term assignment is
- a. increase and multiply.
 - b. divide and conquer.
 - c. meals and recreation.
 - d. rules and regulations.
7. An assignment-oriented weekly schedule is appropriate
- a. as a supplement to your master schedule.
 - b. when you face an unusual or a long-term assignment.
 - c. if you don't have big blocks of uninterrupted time.
 - d. for all of the above.
8. Unlike a daily schedule, a list of things to do
- a. works efficiently.
 - b. is only 80 percent useful.
 - c. has no time blocks.
 - d. is written on an index card.

Short answer. Supply a brief answer for each of the following items.

1. What is the purpose of keeping a daily activities log?
2. How does a time schedule increase your sense of control?
3. In what ways does a schedule promote relaxation?
4. What is the advantage of scheduling your time in blocks?
5. Discuss how to prepare a task-oriented master schedule.

THE WORD HISTORY SYSTEM

assassin as-sas'-sin *n.* 1. One who murders by surprise attack, esp. one who carries out a plot to kill a prominent person. 2. A member of a secret Muslim order that killed Crusaders and others.

Assassin: *a drinker of hashish*



In eleventh-century Persia, a secret order was founded among the Ismaili, a Muslim sect, by Hassan ben Sabbah. The absolute head of this order was the Old Man of the Mountain. Its members indulged in the use of the drug hashish and, when under its influence, in the fanatical practice of secret murder. This terrible organization spread terror across Persia, Syria, and Asia Minor for nearly two centuries. The murderous drinker of hashish came to be called *hashshāsh*, "one who has drunk of the hashish," and from that origin comes our English word *assassin*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Mathematics has given economics *rigor*, but *alas*, also *mortis*.

—Robert L. Heilbroner (1919–), American economist

- | | | | |
|------------------|-------------|---------------|-----------|
| 1. <i>rigor</i> | strength | exactitude | precision |
| 2. <i>alas</i> | sorrowfully | interestingly | happily |
| 3. <i>mortis</i> | humanity | fear | death |

Interest you owe works night and day, in fair weather and foul. Interest gnaws at a man's *substance* with invisible teeth.

—Henry Ward Beecher (1813–1887), newspaper editor and clergyman

4. man's *substance* brain worth body

Of all the mysteries of the stock exchange, there is none so *impenetrable* as why there should be a buyer for everyone who seeks to sell.

—John Kenneth Galbraith (1908–), Canadian-born American economist, writer, and diplomat (ambassador to India)

5. *impenetrable* incredible inexplicable important

"Involvement" in this context differs from "commitment" in the same sense as the pig's and the chicken's roles in one's breakfast of ham and eggs. The chicken was *involved*—the pig was *committed*.

—Anonymous

6. chicken was *involved* primed rejected associated

7. pig was *committed* solicited included affiliated

MANAGING STRESS

Life is a journey, not a guided tour.

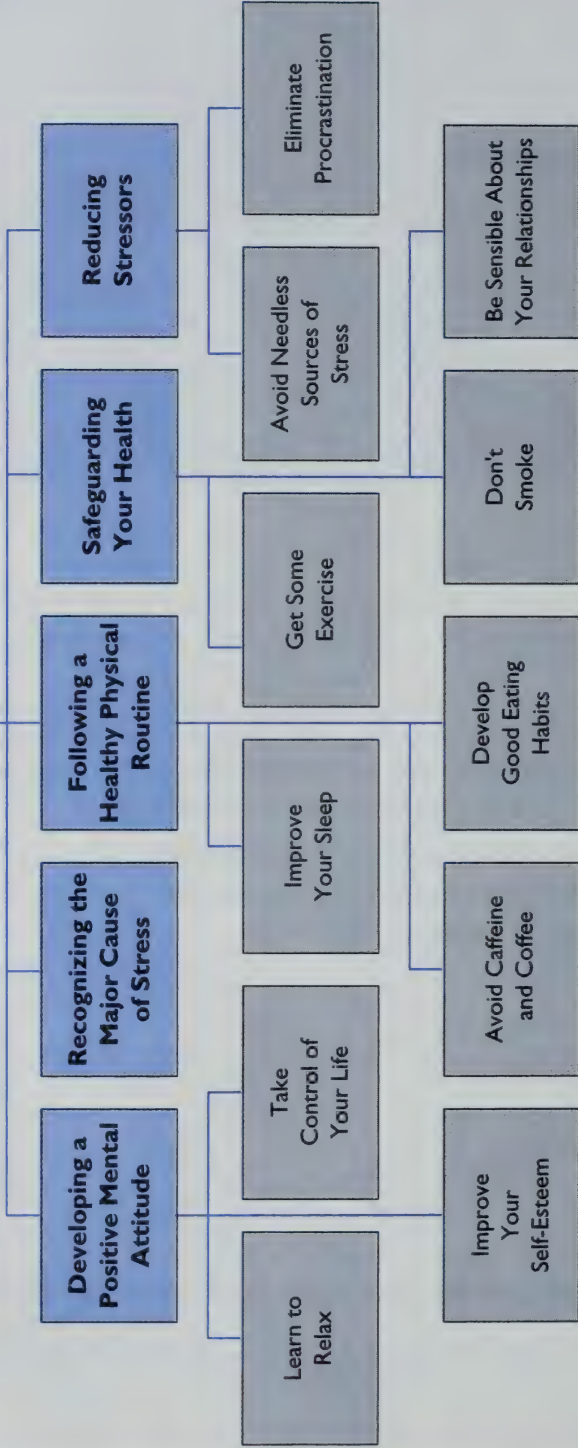
—ANONYMOUS

Stress, writes Dr. Hans Selye, a pioneer in the study of stress, is “the spice of life or the kiss of death—depending on how we cope with it.”¹ Unfortunately, most of us cope with it badly. We worry too much, criticize too much, get angry too often, and become too tense. But if you can learn to deflect the stress that comes your way, you can thrive, as a student and as a human being. This chapter helps you manage stress by focusing on:

- Developing a positive mental attitude
- Following a healthy physical routine
- Reducing stressors

¹Hans Selye, “How to Master Stress,” *Parents* 52 (November 1977): 25.

MANAGING STRESS



More mention of the word *stress* is enough to make most people anxious. It brings to mind images of frayed nerves, shortened tempers, and rising blood pressure. But being under stress isn't always a bad thing. In fact, stress can prompt us to respond effectively to a tough situation, to rise to the occasion when a paper comes due or a test is handed out. According to Marilyn Gist, a professor at the School of Business Administration of the University of Washington, "A certain amount of stress is healthy and beneficial; it stimulates some to perform, makes them excited and enthusiastic."²

"Stress," according to Hans Selye, "is the nonspecific response of the body to any demand made upon it."³ In other words, it is the body's attempt to adjust to a demand, regardless of what the demand may be. You undergo stress when you run or walk at a brisk pace. Your body responds to the demand for more oxygen by increasing your breathing and causing your heart to beat faster. Yet most people view exercise not as a source of stress, but as a means of stress relief. Likewise, watching a quiz show or doing a crossword can both be considered stressful. In each case, the brain responds with increased mental activity. Yet most people undertake these activities specifically for relaxation.

The problem is that we don't always respond to the sources of stress (known as *stressors*) in such a positive fashion. If instead of running for exercise, you're racing to catch a bus, or instead of solving a crossword puzzle, you're struggling with a math test that you didn't study for, your reaction is apt to be quite different. Rather than experiencing the exhilaration of exercising or the stimulation of solving a puzzle, you may wind up feeling exhausted or intimidated.

That's the two-sided potential of stress. Instead of compelling us to rise to the occasion, stress can sometimes plunge us down into a sea of anxiety, worry, hostility, or despair. The way we respond to stress, whether we use it as a boon or a burden, depends on two major factors: our overall approach to life and the number of stressors we face at any one time. These two factors can for the most part be controlled, which means you can basically decide whether stress will have a positive or negative effect on your life. To improve the chance that stress will affect you positively, you are wise to adopt a positive mental attitude, follow a healthy physical routine, and limit the number of stressors that confront you at any one time.

²Quoted in Pam Miller Withers, "Good Stress/Bad Stress: How to Use One, Lose the Other," *Working Woman* (September 1989): 124.

³Hans Selye, *Stress Without Distress* (New York: J.B. Lippincott, 1974), p. 27.

DEVELOPING A POSITIVE MENTAL ATTITUDE

Although you can't turn away disaster simply by keeping a smile on your face, there are now abundant indications that your overall attitude can have a powerful influence on the outcome of potentially upsetting or stressful situations. The first evidence was offered near the end of the nineteenth century, when American philosopher and psychologist William James and Danish psychologist Carl Lange simultaneously developed a remarkable theory of emotion. You don't cry because you're sad, they suggested. You're sad because you cry. This revolutionary reversal of the apparent cause and effect of emotions briefly sent the scientific community into an uproar. As the twentieth century progressed, this controversial proposal, known as the James-Lange theory, was scoffed at by most members of the mainstream scientific community and was advocated instead by "inspirational" writers and speakers such as Dr. Norman Vincent Peale, who championed the virtues of "positive thinking." Now the James-Lange theory has been vindicated, and Peale's ideas, bolstered by recent scientific evidence, have garnered mainstream defenders.

As part of a study conducted in 1983 by Paul Ekman, Robert W. Levenson, and Wallace V. Friesen at the Department of Psychiatry of the University of California, San Francisco, subjects were given specific instructions for contracting various facial muscles to imitate six basic emotions: happiness, sadness, disgust, surprise, anger, and fear.⁴ Instead of being told, for example, to "look scared," the subject was instructed to "raise your brows and pull them together, now raise your upper eyelids and stretch your lips horizontally, back toward your ears."⁵ Expressions were held for ten seconds, while electronic instruments measured the subjects' physiological responses.

The results were fascinating. Simply imitating an emotional expression was enough to trigger the physiological changes normally associated with that emotion. The most interesting contrast was between expressions for anger and for happiness. The average subject's heart rate and skin temperature increased more with anger than they did with happiness. Yet the subjects weren't truly angry or happy: They were just imitating the expressions associated with these two emotions.

We can conclude from this study that simply putting on a happy face may make you feel happier and that taking a dim or overly pessimistic view can lead to the discouraging outcome you expected. But managing

⁴Paul Ekman, Robert W. Levenson, and Wallace V. Friesen, "Autonomic Nervous System Activity Distinguishes Among Emotions," *Science* 221 (1983): 1208-1210.

⁵*Ibid.*, p. 1208.

stress shouldn't simply be a fuzzy-headed smile-at-all-your-troubles strategy. Improving your attitude should be done systematically by learning to relax, by improving your self-esteem, and, above all, by *taking control of your life*.

Learn to Relax

The regular use of relaxation techniques, according to studies at the Mind/Body Medical Institute of Harvard Medical School, reduces stress and the prevalence of stress-related illness.⁶ But many of us don't consider using such techniques because we misinterpret what the word *relaxation* means. Relaxation doesn't necessarily mean you're about to fall asleep. In fact, some World War II pilots used relaxation techniques not to prepare themselves for sleep or to "take it easy," but to stay alert and avoid fatigue during bombing missions.⁷

Nor is relaxation a synonym for lethargy. "Relaxation," wrote psychologists Edward A. Charlesworth and Ronald G. Nathan in *Stress Management*, "simply means doing nothing with your muscles."⁸ Relaxation therefore is relief from wasted effort or strain, an absence of tension. Indeed, explains author Emrika Padus, "Tenseness wastes energy; tenseness causes anxiety. . . . The best performances come when the mind and body are *floating*, enjoying the activity just as we did when we were young children, completely absorbed in the experience and unaware of any consequences of the actions. This is true relaxation."⁹

There's nothing mystical about relaxation. Two simple techniques—breathing deeply and using progressive relaxation—can help you get the hang of this life-sustaining practice.

Breathe Deeply There is a strong connection between the way you breathe and the way you feel. When you're relaxed, your breaths are long and deep, originating from your abdomen. When you're anxious, your breathing is often short and shallow, originating from high in your chest.

This link between breathing and emotion operates in both directions. Just as the way you feel affects the way you breathe, the way you breathe

⁶Stephanie Wood, "Relax! You've Earned It," *McCall's* 118 (July 1991): 50.

⁷Edward A. Charlesworth and Ronald G. Nathan, *Stress Management* (New York: Atheneum, 1984), p. 41.

⁸*Ibid.*, p. 42.

⁹Emrika Padus, *The Complete Guide to Your Emotions & Your Health* (Emmaus, PA: Rodale Press, 1986), p. 490.

affects the way you feel. A handful of experiments have established this connection. Dr. James Loehr found that when relaxed subjects were asked to take short, rapid, and irregular breaths for two minutes—in other words, to pant—nearly everyone interviewed felt worried, threatened, and panicky.¹⁰ Simply by imitating the response of an anxious person, the subjects had actually made themselves anxious.

Luckily, this principle can be used to encourage relaxation as well. By breathing slowly, steadily, and deeply and by beginning your breaths in your abdomen instead of up in your chest, you can encourage a feeling of relaxation. So just before an exam, an interview, or a dental appointment, when your palms are sweating, your body is tense, and your breath is short and shallow, try the count-of-three method to induce a more relaxed state. Count slowly and calmly through each step:

1. Inhale slowly through your nose while silently counting to three.
2. Hold your breath for the count of three.
3. Exhale slowly through your nose while silently counting to three.
4. With your breath expelled, count to three.
5. Repeat the cycle (steps 1 to 4) several times. (Once you have the rhythm, you need not continue counting; but maintain the same timing and the same pauses.)

Use Progressive Muscle Relaxation A big advantage of the count-of-three method is that it can be done inconspicuously almost anywhere, including in an exam room. But if you have some time, a quiet place, and a little privacy, you may want to try progressive muscle relaxation (PMR), a method for systematically tensing and relaxing the major muscles in your body.

PMR was developed more than seventy-five years ago by Edmund Jacobson, a doctor who saw the connection between tense muscles and a tense mind. PMR works by helping you become aware of the difference between how your muscles feel when they're tensed and how they feel when they're relaxed.

Start PMR by assuming a comfortable position, either sitting or lying down, and by closing your eyes. Make a tight fist with your right hand, and at the same time tense your right forearm. Hold this position for five seconds, feeling the tension in both your hand and arm, and then slowly release that tension, letting it flow out of you as you unclench your fist. Repeat the procedure with your left hand, noting the difference between how this hand feels tensed compared with your right hand and arm, which

¹⁰James E. Loehr and Peter J. McLaughlin, with Ed Quillen, *Mentally Tough* (New York: M. Evans and Company, 1986), pp. 141–142.

are now relaxed. Continue by separately tensing your shoulder muscles, your neck, and the muscles in your face. Then start with your feet and toes, moving up each leg; finish by tensing the muscles in your abdomen and chest. Once you've tensed and released every muscle group in your body, take a moment to savor the overall feeling of relaxation. Then open your eyes and end the exercise.

Improve Your Self-Esteem

Self-esteem is your personal assessment of your own value. Unfortunately, many of us are our own toughest critics. We overlook our positive attributes and forget our successes, emphasizing our shortcomings instead and providing ourselves with a silent but constant stream of discouraging dialogue. The stress that results from these inner discouragements is far worse than any criticism we might receive from a nagging parent, an insulting instructor, or an overly demanding boss.

A healthy level of self-esteem is crucial to keeping stress at bay. If your self-esteem needs improvement, rewrite the potentially destructive inner dialogue that haunts you throughout the day and take some time out to dwell on your successes.

Rewrite Your Inner Dialogue You can't rewrite your inner dialogue unless you've seen the script. So, the first step in eliminating the destructive thoughts that undermine your self-esteem is to become aware of them.

Most of us talk silently to ourselves almost continually. Psychologists commonly refer to this inner conversation as *self-talk*. Although you may have learned to ignore the sound of your self-talk, the effect it has on your overall attitude can still be damaging. So when you enter a new situation or are faced with a difficult challenge, take a moment to express your apprehensions to yourself. Then listen to your self-talk. Whenever you have a negative thought, counteract it with a positive one. Remember that the thoughts you have are your own and they're under your control. You can open the door of your mind to whatever thoughts you want. Admit only the positive ones, and leave the negative thoughts out in the cold.

Build on Your Success All of us have experienced success at one time or another. When you feel your self-esteem slipping, remember when you did a job you were proud of, when you overcame an obstacle in spite of the odds, or when everything seemed to go smoothly. It helps to congratulate yourself from time to time, to put yourself in an achieving frame of mind so that you can achieve success again.

Take Control of Your Life

One of the results of increased self-esteem is an increased sense of control, a quality that both medical doctors and psychologists are finding can have a measurable effect on your physical well-being and state of mind. According to the *Wellness Letter* from the University of California, Berkeley, "A sense of control may, in fact, be a critical factor in maintaining health."¹¹ When you're in control, you act; you set your own agenda instead of reacting to the wishes or whims of others or resigning yourself to what we often call "fate."

Control Time, and You Control Stress Stress intensifies when you feel you're running out of time. The solution: Get things done! A vigorous, aggressive approach must become a way of life in the classroom, the laboratory, the library, and elsewhere. Get what you came for! During a lecture, for example, you must be alert and work hard to capture the lecturer's ideas and put them down on paper.

In the library, some students wander about aimlessly or spend time watching other students coming and going. If your purpose is to gather data for your research paper, move on to the computer to gather your references, secure the books, and begin reading and taking notes. Get something done according to plan!

The intelligent use of time plays a large part in keeping stress from becoming a way of life. Plan your time wisely; then be sure to follow the plan.

Appreciate the Significance of Control In the early 1960s, writer and magazine editor Norman Cousins was stricken with a painful and terminal illness. Determined not to let the illness control his life and sentence him to death, Cousins fought back. He watched movie comedies, one after another. The laughter the films elicited made the sleep that had eluded him come more easily and ultimately reversed the crippling illness.¹² In fact, the results were so impressive to the medical community that Cousins, who had no medical background, was awarded an honorary degree in medicine from the Yale University School of Medicine and was appointed adjunct professor in the School of Medicine at the University of California, Los Angeles.

Norman Cousins is not the only person who has demonstrated the importance of a sense of control. Author Richard Logan investigated the lives

¹¹"Healthy Lives: A New View of Stress," *University of California, Berkeley, Wellness Letter* 6, no. 9 (June 1990): 4.

¹²*Managing Stress—From Morning to Night* (Alexandria, VA: Time-Life Books, 1987), p. 21.

of people who were able to survive extreme stress—such as imprisonment in a concentration camp—and found that they all had at least one quality in common: a belief that their destiny was in their own hands. In other words, they had a sense of control.¹³

The importance of control was reinforced in a study that provided a physiological insight into the phenomenon. When your body is under stress, your adrenal glands release *cortisone*, a hormone that in small doses can fight allergies and disease but that in larger amounts can impair the body's ability to fight back. When the two groups of employees who made up the study worked almost to the point of exhaustion, only one group experienced a significant increase in cortisone production. Those employees with high levels of cortisone had jobs that allowed them very little control. Those employees who experienced no increase in cortisone held positions with a high level of control.¹⁴

A lack of control can result in a sense of helplessness almost guaranteed to bring about the frayed nerves, tense muscles, and overall feeling of panic normally associated with short-term stress. If these conditions persist, they can have an adverse effect on your body's immune system, making you more susceptible to illness. Robbed of your sense of control, you not only react instead of acting but also overreact. Turned outward, this overreaction may surface as anger. Turned inward, it can lead to fear, anxiety, and general depression.

In *The Joy of Stress*, Dr. Peter Hanson describes an experiment in which two groups of office workers were exposed to a series of loud and distracting background noises. One group had desks equipped with a button that could be pushed at any time to shut out the annoying sounds. The other group had no such button. Not surprisingly, workers with the button control were far more productive than those without. But what's remarkable is that no one in the button group actually pushed the button. Apparently the knowledge that they could shut out the noise if they wanted to was enough to enable them to work productively in spite of the distractions. Their sense of control resulted in a reduction in stress and an increase in productivity.¹⁵

Understand How Attitude Affects Control Dr. Hanson's story of the control button underscores an important element of control: Taking control is primarily a matter of adjusting your attitude. As a student, you can achieve a sense of control by changing the way you view your courses, assignments, and exams.

¹³Mihaly Csikszentmihalyi, *Flow: The Psychology of Optimal Experience* (New York: Harper & Row, 1990), p. 203.

¹⁴Robert M. Bramson, *Coping with the Fast Track Blues* (New York: Doubleday, 1990), p. 217.

¹⁵Peter Hanson, *The Joy of Stress* (New York: McMeel & Parker, 1985), pp. 15–16.

Taking control of your classes and assignments means viewing them as choices instead of obligations. The stressed-out, overwhelmed student looks to the next lecture or reading assignment with dread, seeing it as a burden he or she would rather do without. The student who feels in control (and feels confident as a result) understands that he or she attends lectures and completes assignments as a matter of choice and that the benefits derived from both are not only practical but also enjoyable. According to psychologist Mihaly Csikszentmihalyi, "Of all the virtues we can learn, no trait is more useful, more essential for survival and more likely to improve the quality of life than the ability to transform adversity into an enjoyable challenge."¹⁶

Even students who feel they have their assignments under control can feel swamped by the prospect of an exam or a paper assignment. But by shifting their attitude, they can transform a dreaded paper or final into a challenge. Although the pressure is still on, students who take control prepare with confidence and relish the opportunity to demonstrate what they know.

Learn to Cope with Out-of-Control Circumstances Clearly, a great many situations in life are out of your control. But even in unavoidable or unpredictable situations, you can still exercise some degree of influence. Psychologists have found that as your coping resources increase (both in number and in variety), so does your sense of control. Thus, a person with multiple coping strategies, instead of just one plan, is better able to adapt to the inevitable surprises that can accompany almost any undertaking.

For example, you have no control over whether an upcoming exam will be made up of essay or multiple-choice questions. If the instructor doesn't tell you which type it will be, you can increase your coping resources by preparing for both types of questions. Then regardless of what type the instructor chooses, you will be ready. You will have a feeling of control.

The same strategy can be applied to a number of mundane situations that often generate unwanted stress. An unexpected line at the bank or the grocery store can leave you feeling helpless and anxious. You can't make the line disappear or move more quickly, but you can put the situation back in your control by reading a book or reviewing a set of vocabulary cards while you wait. As you can see, even a small degree of control can be used to minimize a large amount of stress.

¹⁶Csikszentmihalyi, *Flow*, p. 200.

RECOGNIZING THE MAJOR CAUSE OF STRESS

Individual stress, in most cases, is self-inflicted—not purposefully, but because of procrastination; that is, by (1) lack of control over one’s actions and (2) disguised laziness. Here’s how stress is self-inflicted:

One evening, Harry promised himself, “Okay, I’m going to make a fresh start. I’ll set the alarm for 6:30, which will give me time to shower and shave, get over for a good breakfast, then go on to Goldwin-Smith Hall, where I’ll have time to look over the notes of the previous lecture and get set for Professor Larson’s lecture on Scandinavian epics.”

Next morning: Alarm clock buzzes, a hand slaps the “off” button, and Harry’s groggy, sleep-drugged mind rationalizes, “I’ll take five more minutes. I set the alarm too early anyway.”

An hour later, Harry springs out of bed like a jack-in-the-box, muttering, “I must have *really* fallen asleep again.” Then, bolting for the bathroom and splashing some water on his face, he mumbles, “I’ll shave when I get back.”

By now, the pituitary gland is injecting its third dose of adrenaline directly into his bloodstream as the harried Harry streaks for Goldwin-Smith Hall. All eyes follow the perspiring and hyper student to his seat, where he fumbles for his notebook and pencil. Yes, he hears words, but the fast lub-dub, lub-dub of his heart makes it difficult to attach any meaning to them. By now the heat from his face has clouded his glasses, so with his shirttail, he wipes the lenses. By the time he’s settled, he feels lost, so he just slumps in his seat, thinking, “I’ll borrow Dave’s notes when I get back to the dorm.”

The first student out of the lecture room, Harry heads for the vending machine and gurgles down a 12-ounce can of cola, which is sweetened by at least eight full teaspoons of sugar. This sugar is quickly absorbed into the bloodstream, which, now overloaded, triggers the pancreas to secrete insulin. As usual, the emergency secretion is too large, thus neutralizing more sugar than Harry ingested from the can of cola. His lowered-blood-sugar condition would normally leave Harry feeling “washed out,” but the insulin keeps him hyper and going. A day thus started is likely to continue to bedtime, interfering with sound sleep. What a day! What a self-inflicted condition of stress! All for that extra “five minutes” of sleep.

Pulling an all-nighter to study for an exam or to beat the deadline for writing a term paper is a prime example of inflicting a condition of stress upon oneself, because of procrastination. To eliminate the need for an all-nighter, all we need to do is study for the exam from the first day of class and begin the term paper on the day the assignment is announced by the professor.

FOLLOWING A HEALTHY PHYSICAL ROUTINE

Stress isn’t all in your head. It has a noticeable effect on your body and can often be avoided through changes in your physical routine. If you make a

concerted effort to improve your sleep, develop good eating habits, and get some exercise, you'll make yourself more stress-resistant and decrease your chances of being subjected to stress in the first place.

Improve Your Sleep

If your morning starts with the sound of an alarm clock, then you're probably not getting the sleep you need. According to Dr. Wilse Webb, a psychologist at the University of Florida, Gainesville, "If that's how you wake up every day, you're shortening your natural sleep pattern."¹⁷ And yet an alarm clock is a part of most people's lives. Does that mean *all* of us are cheating ourselves on sleep? Perhaps not all, but most Americans are getting less sleep than they actually need. In fact, according to an article in *The New York Times*, "sleep scientists insist that there is virtually an epidemic of sleepiness in the nation."¹⁸

The image of a nation filled with semiconscious citizens may seem comical, but in reality the effects of widespread sleep deprivation are seldom humorous and sometimes deadly. The U.S. Department of Transportation estimates that up to two hundred thousand traffic accidents each year are sleep-related.¹⁹ Furthermore, the worst nuclear power emergency in this country's history, at Three Mile Island, occurred at night, when workers were most susceptible to the effects of insufficient sleep.²⁰ Also, lack of sleep was implicated in the *Exxon Valdez* oil spill and the space shuttle *Challenger* disaster.

Even though the consequences of sleep deprivation normally are not deadly, college students do suffer from them. Dr. Charles Czeisler, director of circadian (the daily rhythmic sleep/wake cycle) and sleep disorders medicine at Brigham and Women's Hospital in Boston, outlined some of the penalties that people pay for getting too little sleep: "Short term memory is impaired, the ability to make decisions is impaired, the ability to concentrate is impaired."²¹ Clearly, a student who can't remember, can't make decisions, and has trouble concentrating will have a tough time surviving in an academic setting. Furthermore, the struggle to overcome the disabilities that sleep loss creates frequently leads to an even more pervasive problem: stress.

¹⁷Quoted in Natalie Angier, "Cheating on Sleep: Modern Life Turns America into the Land of the Drowsy," *The New York Times* (May 15, 1990), pp. C1, C8.

¹⁸*Ibid.*, p. C1.

¹⁹Anastasia Toulexis, "Drowsy America," *Time* (December 17, 1990), p. 80.

²⁰Angier, "Cheating on Sleep," p. C8.

²¹Quoted in Angier, "Cheating."

"Weariness corrodes civility and erases humor," reads an article in *Time* magazine. "Without sufficient sleep, tempers flare faster and hotter at the slightest offense."²² The day-to-day challenges and inconveniences of going to school and of living in the modern world are potentially stress-inducing. Add in habitual sleep loss, and you turn a chronic problem into an acute one. Dr. Ernest Hartmann's study of "variable sleepers" (patients whose sleep and wake-up times are not consistent) revealed that people under stress tend to need more sleep than those who lead a life relatively free of anxiety and change. Yet stress often triggers insomnia, which leads to less sleep and the chance for even more stress.²³ The results can be a vicious circle of stress and sleeplessness.

Get the Right Amount of Sleep Sleep loss: You cannot escape the penalty that sleep loss imposes upon your ability to think creatively during an exam the next day. "Sleep loss affects divergent thinking, or the ability to think creatively, flexibly, and spontaneously."²⁴

If an adequate amount of sleep is so important, then how much sleep should you be getting? Sleep experts have no easy answer to this basic question. The amount of sleep a person requires is based on a number of factors, including age, heredity, and day-to-day stress, and it may vary widely. Sleep researchers generally agree that the average person needs between six and nine hours of sleep each night.²⁵ But college students aren't necessarily average people. A study done by Dr. Mary Carskadon, director of chronobiology at the E. P. Bradley Hospital in Providence, Rhode Island, found that teenagers may require more than nine and a half hours of sleep each night to feel sufficiently rested.²⁶ Indeed, another study seems to add credence to Carskadon's findings. When healthy college students were allowed to lie down in a darkened room in the daytime, 20 percent of them fell asleep almost instantaneously, even though all of them were averaging seven to eight hours of sleep per night.²⁷

How can you be sure that you are getting the right amount of sleep? In general, your overall alertness should serve as a good indicator. If you are getting the right amount of sleep, you should be able to stay awake through twenty minutes of darkness at midday. Students in art history and film

²²Toulexis, "Drowsy America," p. 80.

²³Lynne Lamberg, *The American Medical Association (Straight-Talk, No-Nonsense) Guide to Better Sleep*, rev. ed. (New York: Random House, 1984), p. 35.

²⁴J. A. Horne, "Sleep Loss and Divergent Thinking Ability," *Sleep* 11 (1988):528-536.

²⁵Milton K. Erman and Merrill M. Mitler, *How to Get a Good Night's Sleep* (Phillips Publishing, 1990), p. 5.

²⁶Toulexis, "Drowsy America," p. 81.

²⁷Angier, "Cheating on Sleep," p. C1.

courses, where slides or movies are commonly shown, often complain that a darkened auditorium or classroom makes them sleepy. These situations don't *create* sleepiness. They simply reveal a problem of insufficient sleep and should serve as a warning to get more rest. Sleep behavior experts tell us that on the average, most people fall short of their needed amount of sleep by sixty to ninety minutes each night.²⁸ Aggravating this daily deficit is the fact that sleep loss is cumulative; it adds up. If you feel tired on Monday morning, you're apt to feel even more so when Friday rolls around.²⁹

Although sleep loss adds up, sleep does not. You can't stash away extra hours of sleep like money in the bank. You need to get sufficient sleep seven nights a week. Just as so-called weekend athletes engage in strenuous exercise only on Saturday and Sunday and thereby jeopardize their hearts and their overall health in their effort to "stay fit," people who "sleep in" on weekends don't eliminate the effects of a week of sleep deprivation. In fact, they complicate the problem by disturbing their rhythm of sleeping and waking.

Keep to a Schedule Achieving full alertness isn't simply a matter of getting enough sleep. It's equally important to do your sleeping at the right time of day.

The body has its own internal clock, a natural pattern of wakefulness and sleep that roughly follows the rising and setting of the sun. These cycles of waking and sleeping are known as *circadian rhythms*. Thanks to your circadian rhythms, when morning arrives you instinctively become more alert in anticipation of the day that lies ahead. With the advent of evening, signals in your brain begin preparing you for needed sleep. You go to sleep, and when you wake up the process is repeated.

The way to make the most of these circadian rhythms is to maintain a regular sleep/wake schedule. Sleeping late on the weekends or going to bed at widely varying times throws your circadian rhythms out of whack. You find yourself feeling drowsy when you should be alert, and wide awake when you should be fast asleep.³⁰

If you've ever traveled a great distance by air, you may have experienced a feeling known as *jet lag*, which was prompted because your body's internal clock, "set" in the place where you started, didn't match the clock of the place where you landed. A person who flies from New York to San Francisco, for example, may find herself feeling drowsy at 8 P.M. Pacific time

²⁸Ibid.

²⁹Ibid., p. C8.

³⁰Richard M. Coleman, *Wide Awake at 3:00 A.M.* (New York: W. H. Freeman, 1986), p. 149.

because her sleep/wake cycle was set in the East, where the time is already 11 P.M. And at 4 A.M., when the rest of the West is sleeping, she may be feeling wide awake. But she will soon synchronize her internal clock with Pacific time.

People who stay at home but go to sleep at widely varying times are not so fortunate. They are often plagued by chronic drowsiness and insomnia, a sort of stay-at-home jet lag. If you go to bed at 11 P.M. one night and at 2 A.M. the next, you may wake up the next day and feel as though you've flown across the country. In these situations, even getting the right amount of sleep won't be enough. Your rest will be reduced because you'll be going against the beat of your body's natural rhythms.

If you consistently rise at the same time regardless of when you went to bed, you'll keep your circadian rhythms in tempo.³¹ Furthermore, an unwavering wake-up time should help discourage you from staying up too late.

Students who cheat themselves out of sleep feel they're adding extra hours to their day. They are, of course, but in increasing the quantity of their waking hours, they are reducing the quality. A well-rested student is usually more productive than one who is sleep-deprived, even though the latter student may have more hours of study time available.

Recognize the Truth About Naps Students and others who have flexible schedules often see naps as the solution to sleep deprivation. Unfortunately, naps fall far short of their reputation and actually create a number of problems: They're impractical, they adversely affect learning, they harm both sound sleep and the sleep cycle, and they act as a convenient excuse for chronic procrastinators.

As we have discussed, your circadian rhythm is operated by an internal clock in your brain. It is set in motion by the light/dark cycle. But in taking naps, we need to know about the vital role of the hormone melatonin in maintaining our health.

"Melatonin is the sleep-inducing hormone secreted by the pineal gland. . . . Melatonin not only helps us to sleep, but also may help to prevent tumors since it stimulates our tissues to destroy oxidants, chemical pollutants that produce cancer."³²

"Melatonin levels are high at night when it's dark and we're resting, and low in the daytime when it's light and we're active. Normally, there's

³¹Cooper, *The Performance Edge*, p. 222.

³²Dr. Alexander Grant's *Health Gazette* 18, no. 2 (February 1995). Published by Alexander Grant, M.D., and Associates. P.O. Box 1786, Indianapolis, IN 46206.

at least five times more melatonin in your blood at night than during the day."³³

In addition, naps generally deprive you of two of sleep's more important components: dream, or rapid eye movement (REM), sleep, the period in which all our dreaming occurs, and deep sleep (also called *delta sleep*), which many sleep experts believe recharges our batteries and increases our overall alertness.³⁴ Therefore, if you take a nap, you may be adding to the quantity of your sleep but not to the quality of it because you will probably be lacking the dream and deep sleep that your body requires. "There is no doubt that this deep sleep is essential to health. Muramyl peptides, which are vital to tissue renewal and immune enhancement, are only released during deep, slow-wave sleep."³⁵

As you might expect, naps also interfere with your sleep/wake cycle. Unless you take a nap every day at the same time and for the same duration, you will probably wind up with stay-at-home jet lag and have difficulty falling asleep at night.

Finally, the temptation to misuse naps can be great. Many students give in to the urge to sleep, rationalizing that when they awake they will feel refreshed and perform more productively. Unfortunately, few students report this happy result. The harsh reality is that if you try to escape a mountain of work by taking a nap, you will wake up to face the same amount of work, and you'll have less time to do it in. It is far better to combat the desire to sleep, get the work done, and go to bed at your usual time with a clear conscience. You'll get the sleep you need, you'll minimize disruptions to your body's circadian rhythms, you'll feel healthier and more alert, and you'll be less susceptible to the potentially corrosive effects of stress.

Take Solid Steps for Better Sleeping Optimal sleep promotes not only a more alert, energetic, zestful life but also, according to some studies, a longer life. If you're not concentrating, if you're dozing off in class and at your desk, or if you're feeling dragged out, take steps to put yourself on the right track.

The right track means deep sleep in a dark room, which activates secretion of melatonin by the pineal gland. Also, under these favorable conditions, the pituitary gland releases large quantities of growth hormone into the blood. The hormone travels throughout the body to restore and rebuild body tissue. When you don't give the rebuilding process enough time, you upset the body's processes. For example, in a sleep-deprived state, the rate

³³Dr. Marcus Laux, *Naturally Well* 2, no. 10 (October 1995): 4. Published by Phillips, Inc., 7811 Montrose Road, Potomac, MD 20854.

³⁴Dianne Hales, *The Complete Book of Sleep* (Menlo Park, CA: Addison-Wesley, 1981), p. 18.

³⁵William Campbell Douglass, M.D., *Second Opinion* 4, no. 12 (December 1994): 7. Published by Second Opinion Publishing, Inc., Suite 100, 1350 Center Drive, Dunwoody, GA 30338.

that the brain metabolizes glucose slows down; thus thinking slows down. Researchers calculate that a sleep-deprived person takes about one hour to do the same work that could be done in forty-five minutes during the feeling-good stage.

You can incorporate a few simple practices into your daily life to optimize the quality of your sleep:

Schedule something active during your post-lunch slump. Sitting in a dark room between 2:00 and 4:00 in the afternoon can be risky. If you're planning on taking a class in which slides or movies are shown, try to avoid scheduling it during this time. If you don't have a class at this time, do something energetic, like running errands, sorting papers, practicing a musical instrument, or exercising to pull yourself through this daily dull period. If your energy seems to flag at other times, take frequent five-minute breaks, or slowly pace the floor while you read a book or recite a lesson.

Don't use caffeine after 4 P.M. or alcohol after 8 P.M. The effects of caffeine can often result in insomnia and thus throw your sleep/wake schedule off.³⁶ Alcohol, although it has a reputation for making you drowsy, actually upsets your body's sleep pattern, first by reducing your REM sleep and then by triggering a "REM rebound," which can result in excessive dreaming and/or nightmares.³⁷

Reserve your bed for sleeping. Eating, doing coursework, and even worrying in bed can scramble your body's contextual cues. If your bed becomes a multipurpose area, you may find it more difficult to fall asleep when the time comes.

Exercise! In addition to the benefits it provides to your heart, muscles, and self-esteem, exercise also enhances both the waking and sleeping phases of your circadian rhythms. Twenty minutes or more of vigorous aerobic exercise will boost your alertness in the daytime and improve the quality of your sleep at night. People who exercise regularly have been found to enjoy more deep sleep than people who don't.³⁸

Avoid Caffeine and Coffee

Caffeine will keep you awake at night. If you are one of the many people who are sensitive to caffeine, even one cup of coffee toward evening will prevent you from falling asleep easily. Laboratory studies show that from

³⁶Erman and Mitler, *How to Get a Good Night's Sleep*.

³⁷Coleman, *Wide Awake at 3:00 A.M.*, p. 124.

³⁸*Ibid.*, p. 146.

Caffeine: A Poor Substitute for Sleep

Caffeine is the most widely used drug in the United States. Many people drink a cup of coffee or a can of caffeinated soda to produce the feeling of alertness normally associated with sound sleep. Ironically, though, caffeine can actually lead to sleepiness.



- Although morning coffee can mean morning alertness, afternoon coffee may cause afternoon blahs.
- Regular use of caffeine reduces its ability to stimulate alertness.
- Large quantities of caffeine can induce behavioral depression, which results in sleepiness and decreased performance.
- Caffeine burns calories (energy) as it stimulates insulin production, leading to a sudden drop in blood sugar and feeling of lethargy.
- Drinking only 250 mg. of caffeine can produce symptoms associated with clinical anxiety.

Sources: Richard M. Coleman, *Wide Awake at 3 A.M.* (New York: W.H. Freeman & Co., 1986); Susan Perry and Jim Dawson, *The Secret Our Body Clocks Reveal* (New York: Rawson Associates, 1988); Jere E. Yates, *Managing Stress* (New York: AMACOM, 1979).

200 to 500 milligrams of caffeine per day may produce headaches, nervousness, and gastrointestinal disturbances in some people. Coffee is not the only substance that contains caffeine. There's also caffeine in tea, some soft drinks, chocolate, and some nonprescription drugs.

Coffee apparently may do more damage than simply keeping you awake. It has been linked to diabetes, heart attacks, and cancer of the colon, urinary tract, and stomach. In addition, Harvard University researchers have found a statistical link between coffee and cancer of the pancreas, which is virtually incurable. After admitting that the pancreatic link needs further study, Dr. Brian MacMahon, the leader of the Harvard research team and a three-cup-a-day man himself, nevertheless stopped drinking coffee.

Avoid Soft Drinks

Here's a shocker: People drink more soda than water. "Coca-Cola says over 834 million of their drinks alone are being consumed every single day. Americans now consume in excess of 50 gallons of soda a year, and only 40 gallons of water."³⁹ In a supermarket, a quick glance at shopping carts will probably support the accuracy of this statistic. Another startling statistic is that a twelve-ounce can or bottle of soda is sweetened by ten teaspoonfuls of sugar.

Recently, I was very sorry one morning to see a young man walk to the cab of his truck and guzzle Pepsi from a two-liter plastic bottle, which was already more than half empty. It was only eleven o'clock, and clipping hedges in the hot sun makes one thirsty, I know. But let's look at the sugar he ingested. The bottle contained fractionally more than sixty-seven ounces; at ten teaspoonfuls of sugar per 12 ounces, it adds up to a total of approximately fifty-six teaspoonfuls.

Personally, I'd be afraid of overworking the pancreas as it shoots insulin into the bloodstream to counteract the constant flood of sugar. Over time, the stage could be set for diabetes.

Soda pop, however, is the quintessential junk food. And Americans—especially those in their teens and twenties—are drowning in it. Aside from all the sugar it contains, soda crowds more nutritious foods and beverages out of diets. Teenagers drink almost twice as much soda as milk, robbing their bodies of bone-building calcium during the crucial teen years. Adult consumption almost certainly contributes to obesity and heart disease, the number-one killer in the United States.⁴⁰

In addition, soda and other junk foods create an excess of phosphorus in the body. Phosphorus is an essential micronutrient for the human body. In fact, in small amounts it is crucial to proper calcium uptake and metabolism. Researchers have discovered that the proper phosphorus-to-calcium ratio is approximately one-to-one, whereas the average American ingests two to four times more phosphorus than calcium, chiefly through the intake of soda and other junk foods. When the body realizes it has two to four times more phosphorus than it needs in the bloodstream, it begins pulling calcium from the bones in an effort to bring the phosphorus-to-calcium ratio back into balance. The result? Unhealthy, brittle bones.⁴¹

³⁹David G. Williams, M.D., "Soft Drinks," *Alternatives*, Vol. 6, No. 22, April, 1997, p. 170.

⁴⁰Michael F. Jacobson, letter dated December 29, 1998, p. 6. Center for Science in the Public Interest, publisher of Nutrition Action Healthletter, 1875 Connecticut Avenue, N.W., Suite 300, Washington, DC 20009-5728.

⁴¹Betty Kamen, Ph.D., "Eliminating the Bone Busters," *Startling New Facts About Osteoporosis*, p. 67. Published by Nutrition Encounter, Inc. Box 2736, Novato, CA 94948.

Regretfully, the picture becomes even grimmer. Here's how Dr. David G. Williams describes it:

So, besides the excess sugars and phosphorus, what's so bad about sodas, and what's the skin cancer link? The answer is their color. Cola drinks get their brown color from an ammonia caramel compound called 2-acetyl-4-terahydroxybutylimidazole (THI). Coca-Cola has a patent on THI. Strangely, however, THI isn't just a food coloring agent—the patent on THI is for its ability to *suppress the immune system*.⁴²

All of this reaffirms that clean, cool, fresh water is best.

Develop Good Eating Habits

One aspect of a healthy physical routine is developing good eating habits. That means taking time out for meals and eating the right foods.

Take Time Out for Meals Stress can diminish or deplete certain vitamin and mineral supplies. An erratic meal schedule can help to aggravate this problem. According to nutritionist Jane Brody:

Millions of Americans have fallen into a pattern of too-late-for-breakfast, grab-something-for-lunch, eat-a-big dinner, and nibble-nonstop-until-bed-time. They starve their bodies when they most need fuel and stuff them when they'll be doing nothing more strenuous than flipping the TV dial or pages of a book. When you think about it, the pattern makes no biological sense.⁴³

The simplest way to put some sense back into your eating routine is by beginning each day with breakfast. Breakfast stokes your body's furnace so you have energy to burn for the rest of the day. Lunch and dinner simply throw a few coals on the fire; breakfast gets that fire burning.

Meals not only provide needed nutrients; they also supply you with a necessary break from the stresses of school or work. Here are some stress-relieving suggestions for mealtime:

Don't work as you eat. Time will have been wasted, and you won't have gained the break you deserved when you sat down to eat. As a result, you'll probably feel more stressed than you were before you ate.

Eat quickly, but don't rush. There's a difference. If you have a lot of work to do, you won't have time to while away the afternoon with a leisurely lunch. But if you keep one eye on your sandwich and the other on the

⁴²Williams, *Alternatives*, p. 170.

⁴³Jane E. Brody, *Jane Brody's Good Food Book* (New York: Norton, 1985), p. 187.

clock as you eat, you'll increase your chances of getting indigestion and stress without significantly speeding up your meal.

Eat the Right Foods Dieting advice varies widely, from the prudent to the downright absurd. Nevertheless, there are some basic principles most nutritionists agree on. A recent report from the U.S. Department of Health and Human Services confirmed what nutritionists have long suspected: Americans eat too much protein and fat and not enough carbohydrates. You can improve your diet by eating proteins sparingly but strategically, reducing your intake of fats and simple sugars, and increasing your intake of complex carbohydrates.

Eat proteins sparingly but strategically. Although few nutritionists would dispute the necessity of protein as part of a healthy diet, the importance of protein has been blown out of proportion, while its shortcomings have been downplayed. Protein plays an integral role in your body's upkeep. It builds, maintains, and repairs muscle tissue. Protein also appears to have at least one psychological benefit: alertness. Among the amino acids that make up many proteins is *tyrosine*, which activates two hormones that nutritionist Dr. Judith Wurtman refers to as "alertness chemicals." When the brain produces these chemicals, there is "a tendency to think more quickly, react more rapidly to stimuli, and feel more attentive, motivated, and mentally energetic."⁴⁴

Because protein isn't stored in the body (as sugar and fat are), you need to eat it every day. The National Research Council asserts that a diet that derives 8 percent of its total calories from protein should be adequate for 98 percent of the population. In a similar study, the Food and Nutrition Board came up with a figure of 6 percent. Yet the average American gets a whopping 17 percent of his or her calories from protein.

What happens to all that excess protein? It is stored as fat and sugar and used as an energy reserve. Unfortunately, the chemical process of turning protein into energy yields by-products that must be absorbed by the liver and kidneys and then excreted as waste. The task of absorbing those protein by-products puts a strain on the organs. And when the waste is excreted, needed minerals such as calcium, magnesium, and potassium are eliminated as well. All three of these minerals influence your ability to handle stress.

According to Dr. Michael Lesser in *Nutrition and Vitamin Therapy*, "Calcium shortage may result in a grouchy, irritable, tense disposition."⁴⁵ Even

⁴⁴Judith I. Wurtman, *Managing Your Mind & Mood Through Food* (New York: Harper & Row, 1986), p. 13.

⁴⁵Quoted in Padus, *The Complete Guide to Your Emotions & Your Health*, p. 11

a moderate calcium deficiency can prompt symptoms that resemble an anxiety attack. Magnesium, considered a natural sedative by some researchers, was found to be deficient in subjects who exhibited aggressive behavior. Finally, potassium has long been known to moderate the body's level of sodium, which can trigger hypertension if not kept in check.

Reduce your intake of fats and simple sugars. The primary nutritional purpose of fat is to store energy. But you need very little fat to meet your body's requirement for it. Researchers from the National Institutes of Health recommend that we limit fat to roughly 25 percent of our daily calories. Because a gram of fat contains more than twice the calories that a gram of protein or carbohydrates does, meeting or even exceeding your daily requirement for fats is alarmingly easy. Eat a plate of macaroni and cheese, a dinner roll with butter, and a slice of pecan pie for dessert, and you've satisfied your body's fat requirement for the entire day!

Excess fat is even more dangerous than excess protein. Not only does consumption of too much fat lead to obesity, which places undue stress on the body's ability to function properly; it also results in a marked increase in blood cholesterol, which has been linked to a number of life-threatening cardiovascular diseases.

According to one nutritionist, simple carbohydrates such as white flour, refined sugar, and alcohol constitute more than 20 percent of the calories in a typical American diet. What nutritional benefit is derived from these caloric treats? None. With most of their fiber and nutrients removed in processing, these foods provide virtually empty calories—that is, short-lived energy with no long-term food value. In addition, they can take your blood sugar on a roller-coaster ride, leaving you up one minute and down the next. Finally, because simple carbohydrates often cause your blood sugar level to dip so dramatically, eating them can sometimes evolve into an addiction as you constantly seek to boost your energy level as quickly as you can.

Increase your intake of complex carbohydrates. Complex carbohydrates, which we commonly call *starches*, are chains of sugars. Rice, whole grains, beans, and pasta are all examples of complex carbohydrates. Unlike simple carbohydrates, complex carbohydrates are valuable sources of nutrients and fiber. And because they occur in chains, complex carbohydrates take longer to digest, thus releasing their energy gradually instead of all at once.

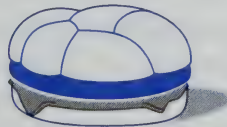
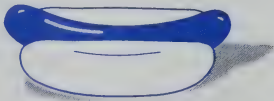
SAFEGUARDING YOUR HEALTH

Before you came to college, you had already formed many habits. Now that you are a college student, you are likely to drop some, modify others, and

Fat: Where to Find It

A surprising number of common foods derive more than 50 percent of their calories from fat. Unfortunately, most of these foods do little to meet the body's need for carbohydrates.

Food	Calories from Fat	Calories from Protein	Calories from Carbohydrates	Total Calories
Vegetable oil	100%	0%	0%	122
Butter (1 T)	100	0	0	108
Margarine (1 T)	100	0	0	108
Mayonnaise	98	1	1	101
Bacon/fried crisp (1 strip)	92	8	0	49
Cream cheese (1 oz.)	89	3	8	101
Bologna (1 slice)	86	14	0	88
Frankfurter (beef)	83	14	3	145
Peanut butter (1 T)	75	12.5	12.5	96
Cheddar cheese (1 oz.)	72	25	3	112
Egg, boiled (1 med.)	69	31	0	78
Ricotta cheese (1/2 c.)	67	7	26	216
Pork chop (3.5 oz.)	66	34	0	354
Tuna in oil (4 oz.)	66	34	0	285
Potato chips (3.5 oz.)	62	3	35	580
Hamburger (1 patty)	61	39	0	224
Roast chicken with skin intact (3.5 oz.)	56	44	0	243
Broiled tenderloin steak	54	46	0	149
Bass, striped, broiled (3.5 oz.)	51	35	14	229



Source: Adapted from Victor Herbert and Genell J. Subak-Sharpe, eds., *The Mount Sinai School of Medicine Complete Book of Nutrition* (New York: St. Martin's Press, 1990), pp. 64–65.

add a few new ones. Take a minute to think about the consequences of the habits that affect your health. If you believe they're good for the long pull, keep them. If not, consider changing them.

In a study of seven important health habits performed by the Human Population Laboratory of Alameda County, California, 6,928 adults were chosen as a cross section of the general population. The habits studied and the conclusions drawn from the research were these:

<i>Habit</i>	<i>Conclusion</i>
1. Smoking	Never smoke.
2. Exercise	Engage in some physical activity daily.
3. Alcohol	Use alcohol very moderately or not at all.
4. Sleep	Get from seven to eight hours of sleep regularly.
5. Weight	Maintain the proper weight.
6. Breakfast	Always eat a balanced breakfast.
7. Snacking	Do not eat between meals.

The results of the study were startling. Women who followed six or seven of these conclusions lived more than *seven years longer* than women who followed from none to three. Men who followed six or seven of these conclusions lived more than *eleven years longer* than men who followed from none to three.

Those seven conclusions are so easy to follow that you might wonder who would value life so little as not to follow them. You might think that no person would trade a year of life for any amount of money; yet for no money at all, many people may be shortening their lives by getting too little sleep, smoking, and drinking too many alcoholic beverages.

Don't Smoke

When asked how long it takes for a cigarette to harm you, one California doctor answered, "About three seconds." In just three seconds, your heart begins to pound an extra fifteen beats per minute, raising your blood pressure about twenty points. And that's just the short-term effect of smoking. The long-term effects on your lungs, heart, mouth and throat, and even your skin are well known and documented. Find out these facts before you consider taking up smoking, and take up something else instead (hiking, tennis, and crafts all offer the opportunity for companionship and give you something to do with your hands).

If you already smoke, for your health's sake quit. Get help on the first step toward quitting by visiting the campus health center and asking about cessation programs, or find the trainer at the gym and ask for advice and

help. If you want to work with someone who knows you already, talk to your doctor about quitting. Recognizing why you smoke is often the first and most important part of a quit-smoking program. Many people have quit successfully; you can, too. Finally, here's an added serious inducement to stop: Some scientists have examined medical records and found that statistically, one cigarette cuts seven minutes from your life span.

Get Some Exercise

According to respected American cardiologist Dr. Paul Dudley White, "Vigorous . . . exercise is the best antidote for nervous and emotional stress that we possess."⁴⁶ In study after study, experts are corroborating that exercise decreases stress and anxiety. Many other researchers report that regular exercise raises self-esteem and well-being and decreases depression. A study of forty-eight students who had been suffering from test anxiety found that their anxiety was reduced after meditative relaxation and exercise.⁴⁷ In another study, both prisoners and prison guards took part in a carefully monitored exercise program. After a regimen of aerobic exercise, participants on both sides of the law found that they were able to sleep better, that their sense of well-being and self-esteem often improved, and that they experienced less tension and depression.⁴⁸

The relationship between exercise and depression, one of the most damaging emotional outgrowths of prolonged stress, led psychologist William Morgan, recent president of the American Psychological Association's Division of Exercise and Sport Psychology, to suggest "that running should be viewed as a wonder drug, analogous to penicillin, morphine and the tricyclics [drugs used to treat depression]. It has a profound potential in preventing mental and physical disease and in rehabilitation after various diseases have occurred."⁴⁹ And the most effective exercise is that done regularly and aerobically.

Exercise Regularly You don't have to be an Olympic athlete to reap the benefits of exercise. Exercising three or more times per week is usually enough to improve your overall conditioning, although many students who follow an exercise routine look forward to their time away from their desks

⁴⁶Quoted in Robert K. Cooper, *Health and Fitness Excellence* (Boston: Houghton Mifflin, 1989), p. 100.

⁴⁷Kenneth H. Cooper, *The Aerobics Program for Total Well-Being* (New York: Bantam Books, 1982), p. 186.

⁴⁸*Ibid.*

⁴⁹Quoted in Keith W. Johnsgård, "Peace of Mind," *Runner's World* 25, no. 4 (April 1990): 81.

and exercise between five and seven times per week. Aside from its well-documented benefits, one of the reasons that exercise is so effective in reducing stress is a simple one. Like eating, sleeping, or any other type of recreation, it provides a welcome break from your studying and recharges your mental and physical batteries.

Exercise Aerobically Although all exercise can provide *relief* from stress, only aerobic exercise can actually *prevent* the harmful effects of negative stress. The word *aerobic* means “relating to oxygen.” Aerobic exercise is any activity that causes a steady, prolonged increase in your breathing and heart rate. A quick sprint across a football field or a dash from home plate to first base is certainly exercise, but it isn’t aerobic exercise. You are inhaling lots of oxygen and speeding up your heart, but you are doing so only for a few seconds, probably not at a steady rate, and definitely not for a prolonged period of time. If, however, you swim twenty-five laps or so, pedal your bike steadily for several miles, or take a brisk thirty-minute walk, in each case you are getting aerobic exercise.

Perhaps the greatest benefit of aerobic exercise is that it lowers your heart rate. Once your heart muscle has been strengthened through exercise, it acts more efficiently, beating fewer times to circulate the same amount of blood. And if anxiety should strike, the increase in the heart rate of an aerobically fit person is not as drastic as it is in someone who gets little or no aerobic exercise. Furthermore, if your heart rate remains comparatively low when subjected to stress, you are less likely to overreact emotionally. The result not only discourages overreaction to stress but also may save your life. A person in poor health who is subjected to unexpected stress can die from the sudden strain the excitement puts on his or her heart.⁵⁰

Exercise provides a perfect example of good stress. It works as a stimulant to release the hormone *norepinephrine*, which promotes enhanced awareness, and *endorphins*, morphinelike hormones that provide the euphoric feeling commonly referred to as “runner’s high.” Exercise leaves you feeling simultaneously alert and relaxed, a nearly ideal state for efficient, prolonged, and stress-free study. According to Dr. Kenneth Cooper, if you exercise at the end of the day when stress levels are traditionally highest, “you can continue to work or play much later into the evening than might be possible otherwise.”⁵¹

Osteoporosis: The Exercise Connection If you’re not getting any exercise, you’re practically begging for osteoporosis. Bones involved in any

⁵⁰Cooper, *The Aerobics Program for Total Well-Being*, p. 189.

⁵¹*Ibid.*, p. 191.

physical activity are strengthened. Conversely, when bones are not involved in physical activity, they weaken dramatically. This is demonstrated beyond a shadow of a doubt by the substantial bone loss experienced by astronauts, even on short space missions. Due to weightlessness, their bone loss is alarmingly accelerated. As osteoporosis researcher and author Betty Kamen points out, "Nature does not waste resources building bone that is not required to support weight."⁵² Fortunately, weight-bearing exercise as simple as taking a long walk once a day will help tremendously.

The following blunt excerpt tells you how to live longer and better without resorting to hormones and vitamins:

Exercise and deep breathing help the lymphatic system get rid of the trash in your body. Keep moving if you want to be healthier. The less you move, the quicker you die.⁵³

Next, Steven Blair, director of research at the Cooper Institute, spells out "longer life" in terms of approximate years. He says:

Regular exercise would increase average longevity by two or three years. Here's a comparison: If someone found a magic bullet that completely cured all cancer, average longevity would increase by less than two years.⁵⁴

In other words, we already have a powerful "magic bullet" to increase longevity if only we would use it. It is up to us.

Be Sensible About Your Relationships

It's not the purpose of this book to tell you everything you should know about protecting yourself from sexually transmitted diseases. It's worth saying, however, that such information—accurate and reliable—is essential to your health and well-being, both in college and after. Make sure you take the opportunity offered by the campus health center to learn what you need to know; it's readily available. Once you have good information, use it wisely.

REDUCING STRESSORS

The number of stressors you encounter can be reduced by sidestepping unnecessary sources of stress and by avoiding procrastination.

⁵²"Eliminating the Bone Busters," p. 5.

⁵³"Exercise and Breathing," *Health News*, Special Report 1998, p. 9.

⁵⁴Steven Blair, "The Benefits of Exercise," *Nutrition Action* 26, no. 1 (January/February, 1999): 4.

Avoid Needless Sources of Stress

Some stressful elements in life must be faced head-on. But others can be avoided; here are some suggestions for doing so:

Wake up a half-hour earlier. If you find yourself skipping breakfast or taking your last bite just as you race out the door, then you're starting your day on a stressful note. Although getting an adequate amount of sleep is crucial, waking up a half-hour earlier than usual won't significantly affect your sleeping habits but can do wonders to ease the pace of your morning preparations.

Allow yourself plenty of travel time. High-strung travelers are easily aggravated by slow drivers or long traffic lights. But slow drivers and long lights are facts of every driver's life. Factor them into your travel time.

Never wait empty-handed. The stress that comes from standing in line or waiting in traffic stems from boredom and from irritation about wasting time. Both problems have the same easy solution: Have a book to read or some notes to review ready for the next time you're kept waiting, and you'll find that the time will fly by. Simply listening to the radio while waiting may be relaxing for some, but in general it won't provide the same sense of accomplishment.

Keep a notepad handy. Needless stress and aggravation can accumulate if you spend your time trying not to forget what tasks you want to accomplish. Jot down reminders, and you'll free up your mind so that what you need to remember will no longer function as a stressor. When a task is completed, cross it off your list. Doing so will increase your sense of accomplishment.

Eat dinner early. If you eat at a college dining hall, it's usually wise to get there early. The trivial but real stress that comes from waiting in line, searching for a seat, or racing to get a second helping before the kitchen closes can be eliminated if you show up soon after the dining hall opens. Whether you eat your meals at home or at school, an early dinner gives you more time before bed to be productive.

Don't take your work to bed with you. Your bed is for relaxation. Don't mix your mind's signals by turning your bed into an auxiliary workspace. If you establish a clear boundary between where you work and where you sleep, your work will become more productive, and your sleep will be more restful. And both activities will tend to improve your approach to life's stressors.

Eliminate Procrastination

“Nothing [is] so fatiguing as the eternal hanging on of an uncompleted task.” These words of William James, distinguished American psychologist, strike at the hearts of us all. Every one of us has had many bouts with procrastination. The best way to avoid future bouts is to learn why people procrastinate and what you can do to prevent procrastination.

Learn Why You Procrastinate There’s no single explanation for why people procrastinate. Nevertheless, many of the stressors already discussed in this chapter can trigger procrastination. Here’s a list of the major sources:

Fear of failure. Many students hesitate even to begin a task because they’re afraid they won’t be able to complete it successfully. Have some faith in yourself. Think back to past successes, and realize that if you’ve achieved success before, you can achieve it again. If you’ve failed in similar situations in the past, think of times when you’ve succeeded in other areas and apply the confidence you gained then to the present.

Fear of success. Some students put tasks off because they are afraid of succeeding. A person might be afraid of success for at least two reasons. First, successful people are a minority. There is a kind of loneliness in success. Some students unconsciously procrastinate because they want to remain part of the group. They don’t want to be resented by people who aren’t as successful. Second, success brings responsibility and choices. When a person succeeds, doors suddenly open. That should be good news, but some students view these opportunities as threats and burdens instead of challenges and choices.

Lack of time. If you used all the time you’ve been spending worrying about the time you don’t have, you’d be well on your way to completing the task you’ve been putting off. This is a problem of control. Realize that how you budget your time is up to you. If you feel in control, you’ll find it easier to complete the jobs that need to be done.

Shortage of energy. Claiming a lack of energy can hide the real reason for not doing something. If you truly don’t have the energy, sleep, food, and exercise may be the root of your problem. Make sure you’re getting enough regularly scheduled sleep, that you’re eating a balanced diet, and that you’re promoting good health and alertness through exercise. If you still feel tired, then some other cause is responsible. It may be a medical problem, in which case you should make a point to see a doctor. Or it may be a psychological problem masquerading as fatigue. In either case, find the cause and take care of it—right away!

Poor organization. Perhaps you begin each day determined to get started on that task you've been putting off. But when nighttime comes, you find that despite your best intentions, you didn't get around to it. If that's your trouble, then the cause may be a lack of priorities and/or poor organization. If you organize what you plan to do each day into a schedule and list your activities in order of priority, then you should be able to accomplish those important tasks.

William James would agree, I'm sure, that not getting started on a report the day the assignment is made is a prime cause of that daily nagging thought, "I gotta get started on that report." The "Peanuts" cartoon graphically illustrates this type of procrastination.



Source: PEANUTS reprinted by permission of United Feature Syndicate, Inc.

Devise Ways to Prevent Procrastination Although the roots of procrastination are varied, the methods that follow for preventing procrastination should work regardless of the cause:

Make your plans a part of the public record. When you have a job that has to be completed or a goal that you want to reach, resist keeping your objective as a logy, easy-to ignore idea in your head. Write down your plan. Once you've preserved it on paper, the job will be harder to ignore. Or announce your intentions to close friends or family members. For example, "I plan to finish the bibliography for my research paper this weekend." Once you've made your intentions official, you're less likely to put them off. Procrastinators commonly fall into the habit of deceiving themselves, but they are less likely to deceive the people around them.

Step back and check your progress from time to time. One way many people procrastinate is by getting entangled in the details of their work. If you plan on finishing an entire chapter assignment in a single evening but then find yourself spending most of your time reading, rereading, and fine-tuning your notes for a single section, you may not be looking for increased understanding. You may simply have found a way to procrastinate. If, however, you periodically step back and measure your progress, you'll realize that you've gotten bogged down, and you'll be able to pick up your pace so you can reach your goal in the allotted time.

Let your momentum work for you. If you've successfully completed a task you were anxious to finish, let your momentum carry over to an activity that you aren't as enthused about. This extra energy you have can help you get started on the dreaded task, and once you've begun (the hardest part), completion will become much easier.

Use the five-minute plan. William J. Knaus, author of *Do It Now: How to Stop Procrastinating*, recommends what he calls the "five-minute plan."⁵⁵ Tackle a long-neglected task by agreeing to work on it for only five minutes. When the five minutes are up, decide whether you want to keep going. You usually will. The hardest part of almost any job is simply getting started. The five-minute plan takes the sting out of that painful first step.

Be specific. A task is almost always more intimidating when it looms large and undefined. For most students, the research paper is a classic example of this nebulous source of anxiety. Instead of constantly telling yourself, "I've got to start writing that research paper," zero in on a specific aspect of your paper, such as choosing the topic or compiling a working bibliography. Suddenly your goal becomes more concrete, more doable, and thus much easier to complete. Or as James R. Sherman, author of *Stop Procrastinating*, puts it, "A job well-defined is a job half done."⁵⁶

Verbalize your excuses. You may think you've got perfectly good reasons for putting off what needs to be done. If you let your excuses see the light of day by writing them out or explaining them to a friend, you'll often find that your reasoning isn't nearly as logical as you'd thought.

Visualize success or completion. Take a moment to imagine yourself accomplishing a task, passing a test, or achieving a goal. Through visualizing, you chart a course in your mind's eye. That course gives you a tangible game plan. The positive outcome you've imagined provides an incentive to follow that course until you reach the point of completion.

SUMMARY

What can you do to relax?

Try the relaxation techniques suggested in this chapter—deep breathing and progressive muscle relaxation—or others you're familiar with.

⁵⁵Quoted in Padus, *The Complete Guide to Your Emotions & Your Health*, p. 393.

⁵⁶James R. Sherman, *Stop Procrastinating* (Los Altos, CA: Crisp Publications, 1989), p. 38.

How can you improve your self-esteem?

Changing the script of your internal dialogue from words of discouragement to words of encouragement and building on your past successes should do a lot to boost your sense of your own value.

How do you take control of your life?

Taking control of your life involves shifting your attitude so that you are able to view threats as challenges and obligations as choices. It also means acknowledging and accepting those situations you are unable to control.

How can regular meal-times discourage stress?

Regular mealtimes can alleviate some of the effects of stress by providing you with a consistent rest from your work and by replenishing some of the energy and nutrients that stress may have consumed.

How does your diet affect your response to stress?

Adequate nutrition can make you more resistant to stress, whereas poor nutrition can make you less stress resistant and can actually increase your susceptibility to stress.

How can exercise help reduce stress?

Regular exercise provides a needed rest from your work and improves the quality of your sleep and your general attitude.

What is the benefit of aerobic exercise?

Aerobic exercise builds up your heart muscle. (Most steady, sustained exercise, such as distance running, swimming, and brisk walking, is aerobic.) When you exercise aerobically, you increase your heart rate and your intake of oxygen. Your heart responds by getting stronger and working more efficiently.

How can you reduce the number of stressors you face?

You can minimize the number of stressors by avoiding needless sources of stress and by eliminating the damaging habit of procrastination.

What can you do to avoid needless sources of stress?

You can deflect or avoid many potentially damaging sources of stress by developing backup plans and by learning to use time more efficiently. You can also identify the causes of procrastination and then find ways to prevent them.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. The body's response to demands that are made on it is known as _____.

stress tension deviation

2. The desire to attain perfection in all that you do usually leads to _____.

failure success cooperation

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------------|--|
| _____ 1. Jacobson | a. Has silent impact on self-esteem |
| _____ 2. Panting | b. Developed progressive muscle relaxation |
| _____ 3. Aerobic | c. Should be eaten sparingly but strategically |
| _____ 4. Proteins | d. Dip in energy, usually in midafternoon |
| _____ 5. Self-talk | e. Means "relating to air" |
| _____ 6. Circadian period | f. Has been shown to cause feelings of panic |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Your body undergoes stress when you walk at a brisk pace.
- _____ 2. Experts don't all agree on how much sleep you require.
- _____ 3. Fear of success is one possible cause of procrastination.
- _____ 4. It is difficult to meet your daily nutritional requirement for fat.
- _____ 5. "Sleeping in" should eliminate the effects of sleep deprivation.
- _____ 6. Your attitude can have a powerful effect on your sense of control.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Relaxed breaths usually originate from the

a. chest.	c. abdomen.
b. waist.	d. neck.

2. Complex carbohydrates are chains of
 - a. fats.
 - b. starches.
 - c. proteins.
 - d. sugars.

3. One of the greatest benefits of aerobic exercise is that it
 - a. takes only ten minutes to do.
 - b. lowers your heart rate.
 - c. burns only fats, not carbohydrates.
 - d. builds up your arm muscles.

4. Common aerobic exercises include
 - a. swimming.
 - b. running.
 - c. bicycling.
 - d. all of the above.

5. Logan found that a group of survivors of extreme stress all
 - a. believed in God.
 - b. had a strong sense of control.
 - c. avoided fats and sugars.
 - d. had lowered heart rates.

6. Your learning may be impaired if you try to study right after
 - a. exercise.
 - b. a large meal.
 - c. a brief nap.
 - d. a final exam.

7. Taking control involves turning
 - a. proteins into carbohydrates.
 - b. threats into challenges.
 - c. choices into obligations.
 - d. food into calories.

Short answer. Supply a brief answer for each of the following items.

1. Explain the “two-sided potential of stress.”
2. What is the James–Lange theory?
3. What makes an exercise aerobic?

THE WORD HISTORY SYSTEM

arrive ar-rive' v. 1. To reach a destination. 2. To achieve success or recognition.

Arrive: *to come to shore*



Latin *ad* means “to” and *ripa* means “shore” or “sloping bank of a river.” These two words combined are found in the Late Latin *arripere*, “to come to shore.” Old French in the course of centuries changed the word into the form *ariver*, and Medieval (Middle) English borrowed it as *ariven*, meaning “to land.” The meaning broadened from “going ashore” to mean reaching a point in any way. Today, when we *arrive* by automobile or airplane, it is interesting to think of the original meaning, “to come to shore.”

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

In a political speech, we catch the phrases that are *emphasized*, and the rest becomes a *numbo-jumbo* of political *innuendoes*.

—Louis E. Boone, author of *Quotable Business*

- | | | | |
|------------------------------------|----------|-----------|--------------|
| 1. phrases . . . <i>emphasized</i> | quoted | stressed | repeated |
| 2. <i>mumbo-jumbo</i> | recital | routine | gibberish |
| 3. political <i>innuendoes</i> | promises | campaigns | insinuations |

Perhaps no other president preferred listening over speaking more than the *taciturn* thirtieth president of the United States, Calvin Coolidge.

—Louis E. Boone, author of *Quotable Business*

- | | | | |
|------------------------------|-------------|-------------|------------|
| 4. <i>taciturn</i> president | untalkative | calculating | diplomatic |
|------------------------------|-------------|-------------|------------|

Only *mediocrities* rise to the top in a system that won't tolerate wave-making.

—Laurence J. Peter (1919–1990), American author

- | | | | |
|-----------------------------|-----------------------|-------------------|--------------------|
| 5. <i>mediocrities</i> rise | intelligent
people | average
people | reliable
people |
|-----------------------------|-----------------------|-------------------|--------------------|

Advertising has *annihilated* the power of the most powerful adjectives.

—Paul Valéry (1871–1943), French poet and philosopher

- | | | | |
|---------------------------------|-----------|----------|-----------|
| 6. <i>annihilated</i> the power | exploited | enhanced | nullified |
|---------------------------------|-----------|----------|-----------|

CONCENTRATING AND FOCUSING

Consider the postage stamp. It secures success through its ability to stick to one thing until it gets there.

—JOSH BILLINGS (1818–1885), PEN NAME OF HENRY WHEELER SHAW, AMERICAN HUMORIST

Everyone—from astronauts to athletes, from merchants to musicians—appreciates the value of concentration. Yet few of us know how to attain and then sustain it. Although concentration does not appear at the snap of the fingers, there are ways you can improve the conditions for concentration. To aid you in learning the art of concentration, this chapter deals with:

- Reducing external distractions
- Finding a place to study
- Overcoming internal distractions
- Adopting strategies for concentration
- Coping with fatigue

CONCENTRATING AND FOCUSING

Understanding
What Concen-
tration Means

Eliminating
Distractions

Adopting Strategies
That Encourage
Concentration

Reduce
External
Distractions

Discourage
Internal
Distractions

Make
Lists

Take
Breaks

Maintain a
Balance

Concentration is focused thinking. During our waking hours we are, with varying degrees of intensity, thinking all the time. We never run out of things to think and worry about. Thoughts and ideas constantly bang, rattle, and knock on the door of our consciousness, trying to gain entry. How to deal with this assault is the subject of this chapter.

UNDERSTANDING WHAT CONCENTRATION MEANS

Watch a good bowler as she takes her position and directs all her thoughts on knocking down the pins at the end of the alley. Watch a quarterback as he focuses entirely on getting a pass to an open receiver, even while linebackers rush in on him from several directions. That's concentration!

Imagine becoming so absorbed in your textbook that you find yourself "talking" to the author: "That's not proof enough," or "Other writers explain it differently," or "I never thought about the problem that way before." Imagine studying your notes so intently that when you finally look up, you see that it's been two hours since you last checked the clock. That's concentration!

Just as light waves can be focused into a single powerful beam—a laser—concentration can focus the power of your thoughts, enabling you to think with greater precision and penetrate difficult ideas. But powerful as it can be, concentration has an elusive quality. In fact, concentration comes only when you don't think about it. Ironically, if you were thinking deeply about a subject and suddenly realized that you were concentrating, at that moment you would have broken your concentration. Such prolonged, undivided attention can be difficult to achieve. After all, in normal circumstances there are dozens of things competing for your attention.

Figure 4.1 provides a vivid illustration of the natural tendency to divide attention. As you gaze at this picture, you'll probably discover that your visual focus is shifting every few seconds so that you first see a goblet, then two profiles, and then the goblet again. Once you're aware of both images, it is difficult for your eyes to focus on one and ignore the other. Similarly, it is hard for your mind to focus on one idea at a time. People who *can* focus exclusively on the task before them have a much better chance of completing that task more quickly and accurately than those who divide their attention even when they don't mean to do so.

Because you can't strive for concentration directly, you must instead try to improve the conditions that promote concentration. That involves eliminating distractions and adopting strategies to enhance concentration.

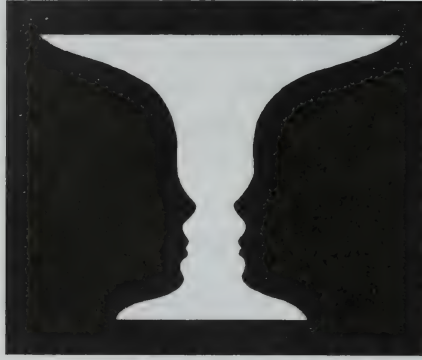


FIGURE 4.1 A Goblet or Two Profiles?

ELIMINATING DISTRACTIONS

Trouble in concentrating may come from external distractions, such as sights or sounds that compete for your attention, or from internal distractions, such as worries or daydreams. Once recognized, these obstacles to concentration can be overcome.

Reduce External Distractions

Anything that stimulates your senses and in the process disrupts your concentration can be considered an external distraction. Study halls and living quarters are overflowing with such distractions, everything from banging doors to baking bread. To work in a way that is compatible with concentration, you need the proper environment as well as the right equipment.

Select the Right Environment Your study environment should be used exclusively for study. In addition, it should be quiet and well lighted. You can take your work to a place that is already designed for study, or you can create your own study environment.

Find a workshop. You'd be hard pressed to find an environment more suitable for high-quality concentration than a library. It offers a minimum of nonacademic distractions, a quiet atmosphere (usually as a matter of policy), and sufficient lighting. Get in the habit right away, on the first day of class, of studying at the library. Even the walk to the library can be used productively as a review session or a refreshing break.

Whether you choose to work in the library or somewhere else, make sure your study area is reserved only for studying. Psychologists emphasize that a conditioning effect is created between the desk and you: If you nap or daydream a lot while sitting at the desk, then the desk can act as a cue for napping or daydreaming. By the same token, if you read or work in bed, you make it difficult to work energetically and to fall asleep easily. To avoid this negative conditioning, use your desk only for studying. When you feel the urge to nap or daydream, leave your desk to nap or daydream elsewhere.

Your study area should be your workshop, a place where you feel secure and comfortable. You can ensure that you have the proper environment for study and concentration if you minimize visual distractions, avoid or eliminate distracting noises, refrain from playing music, control the impulse to register distractions, and provide the area with plenty of light.

Minimize visual distractions. A sheet of notes or a page from a textbook can seem dull compared with a glimpse of a softball game being played on a nearby diamond or a view of gently falling snow. To improve your chances of concentration, avoid competition for your eyes' attention. Study by a window so you can take advantage of the natural light, but keep your head turned away from the potentially distracting view.

Of course, not all visual distractions lie on the other side of a window pane. If your study area contains photographs you're liable to look at, gadgets you're likely to fiddle with, or books you'll be tempted to pick up and read, remove them until you have completed your work.

Eliminate noise. If you need a quiet spot for efficient study, do your utmost to find one. Noise can be one of the most serious obstacles to effective study. Nothing is more wasteful than going over the same paragraph again and again because there is too much noise for you to absorb what you are reading. If the library is the right place for you, then make an effort to study there whenever you can. If you study at home, achieving quiet can sometimes be as simple as closing a door or inserting ear plugs.

Tune down the loud music. When studying, loud music, especially vocal music, can break your concentration. To keep your concentration from bouncing between the music and your books, you expend energy that could be put to better use. However, some students can tolerate music better than others. If you find music nonintrusive, then soft instrumental music could form a pleasing background, and such a background can actually muffle some of the external, intermittent noises.

Try the spider technique. A vibrating tuning fork held close to a spider's web sets up vibrations in the web. After the spider makes a few hurried investigations and finds no fly in the web, it learns to ignore the vibrations.

The next time you are studying in the library and the door opens, don't look up. Controlling your impulse to look up will disturb your concentration the first few times. But very soon, like the spider, you'll learn to ignore these external disturbances.

Use the Right Equipment Because proper lighting is an important component of your study environment, the right light should head the list of the equipment you need to promote concentration and reduce external distractions.

Find the right light. Whether it comes from conventional light bulbs, fluorescent tubes, or the new compact fluorescent bulbs, the best light for study is bright, even, and steady (remember B, E, and ST).

Bright. The emission of light is measured in lumens. For studying, you need at least 2,500 lumens. Two standard 100-watt bulbs (1,750 lumens each) will meet that requirement. So will a double-tube fluorescent lamp; it provides the same amount of light as two 100-watt incandescent bulbs and can last up to one hundred times longer!

Even. Shadows in your work area or "hot spots" caused by glare will tire out your eyes and make concentration difficult. Get rid of glare by shielding your lamp with a shade and by using a light-colored, nonglossy blotter on your desk. Eliminate shadows by using two lamps, fluorescent light, or diffuse light.

STeady. A constant flicker will undermine concentration. If you use fluorescent light, try a double- or triple-tube lamp. These multitubed fixtures eliminate the natural strobe of fluorescent light. If you are using conventional (incandescent) light, make sure the bulb is screwed in properly.

Good lighting makes for good studying. By contrast, poor lighting makes for eyestrain, general tension, headaches, and sleepiness—irritations that interfere with concentration. If you study under good light but your eyes still bother you, have them examined by an ophthalmologist or optometrist. Clear and comfortable vision is essential to good studying.

Use a pencil to catalyze concentration. A technique that has never failed any student over the past many years is the simple, humble *pencil technique*. The technique is this: *Whenever you are working to learn, study with a pencil in hand. And use it!* For example, if you are reading a textbook chapter, stop after several paragraphs and very briefly, in your own words, write down the key points made by the author. If, after reading several paragraphs, you find that no words come to you, then you have no recourse but to go back and read the passage again. This time, read with determination and concen-

tration, to make sure that you learn the key points. The secret: Activity promotes and almost ensures concentration. The pencil provides the activity!

Find a comfortable seat. More ink and more words have been wasted extolling the virtues of a straight-backed, hard-seated hickory chair than on any other single piece of study equipment. Forget it: Use a comfortable, well-cushioned chair. Keeping awake or falling asleep does not depend on your chair; rather, it depends primarily on the method of study, your attitude and self-discipline, the light, and the room temperature. A hard, straight-backed chair can't take the place of these basic requirements.

Use a bookstand. An extremely practical piece of equipment is a bookstand. I don't mean a bookshelf or bookends; I mean a stand that is placed on your desk to hold the book in a tilted position with the pages held down so that they do not flip over. It can work for you in many ways. First, and very important, it can give you a feeling of readiness to study—a feeling of being a scholar in the traditional sense. This alone is worth many times the price of a stand. Second, the stand provides physical freedom. It eliminates the strain of continually holding the book open, pressing down on two sides to keep the pages from flipping over, tilting the book to avoid the glare, and trying to find something heavy enough to hold the book open so you can free your hands to make notes. It permits you to sit back with arms folded, to contemplate and reflect on the meaning of what you are reading.

Keep other equipment nearby. Other basic equipment that can help you study without interruption includes an up-to-date dictionary, a calculator, a clock, a calendar, paper, notebooks, paper clips, tape, rubber bands, pencils, pens, erasers, and note cards. If you make it a habit to keep your desk well stocked, you won't derail your concentration with unplanned emergency trips to obtain necessities.

Discourage Internal Distractions

Internal distractions are distractions that *you* create: daydreams, personal problems, anxiety, indecision, forgetfulness, and unrealistic goals. These distractions are as disruptive as the sights, sounds, and smells that make up the external variety, even though in this case the only one who is aware of them is you. Because internal distractions come from within, you have the power to eliminate or at least control them.

Use a Concentration Scoresheet Keep a sheet of paper handy by your book. Then whenever you catch your mind wandering, keep score by putting a check mark on the sheet. The mere act of doing this reminds

you to get back to work. Students report that when they first tried this system, they accumulated as many as twenty check marks per textbook page, but after one or two weeks, they were down to one or two check marks per page.

The concentration scoresheet encourages self-observation. Taking note of your breaks in concentration—when they happen, how often they occur, and what triggers them—will make you realize just how intrusive the lapses are and will enable you to gradually eliminate them.

Put Stray Thoughts on a Worry Pad Although pleasant plans and diverting daydreams can be major sources of internal distraction, nagging worries and obligations can also take your mind off your work. The concentration scoresheet will alert you to these breaks in your attention, but it won't address the problems that prompted the distraction. To prevent the same worries from interfering with your concentration again and again, you must address them. A worry pad provides an excellent short-term solution to the problem.

When an intrusive thought disrupts your concentration, write it down on your worry pad with the idea that you will attend to it just as soon as you get the chance. Then with your conscience clear and your bothersome thought recorded on paper, you can get back to the business of concentration. After you have finished studying, read over your list and give these concerns your full attention. If you cannot alleviate them yourself, get the help of friends or counselors.

ADOPTING STRATEGIES THAT ENCOURAGE CONCENTRATION

Although the best way of encouraging concentration is usually to discourage distractions, you can also take positive actions to improve your concentration. Get into the habit of making lists, taking regular breaks, and maintaining a balance between the challenge of a particular assignment and the level of your skill.

Make Reminder Lists

As we have seen, keeping random thoughts and information in your head instead of writing them down is a primary impediment to concentration.

Use lists to remind yourself of day-to-day obligations and to catalog all the study equipment you're likely to need.

To avoid worrying about the possibility of missing personal appointments and forgetting those things you've set out to do, write them down on your daily schedule (see Figure 2.4, page 39). As a result, you will be able to shift smoothly from one activity to the next without breaking your concentration.

Take Breaks

If you allow physical energy to build up unabated, your mind will race. If you keep repressing concerns that compete for your attention, those concerns will eventually triumph and scuttle your concentration. And if you persist in denying such a basic instinct as hunger, all you'll be able to think of is food.

If, however, you take a few minutes to defuse these distractions, stand up and stretch, address a problem you've been avoiding, or grab a healthy snack to tide you over, you can return to your work ready to concentrate.

Maintain a Balance Between Your Goal and Your Skills

Psychologist Mihaly Csikszentmihalyi believes that the most intense and rewarding kind of concentration (which he calls "flow") comes when you develop a balance between the challenge of the work you are doing and the level of skills you possess.¹ If the challenge of an assignment overwhelms your skill level, then anxiety—not concentration—is likely to result. Conversely, if your skills are high but the assignment isn't challenging, then you're apt to become bored and easily distracted. Finally, if both your skill level and the challenge of an assignment are low, then you'll probably become apathetic and have no desire to concentrate.

Here are some strategies for boosting your skills and raising your interest level.

Find a Tutor If you find yourself struggling with a subject, don't procrastinate. Before you reach the point of anxiety—or worse, apathy—get a

¹Richard Flaste, "The Power of Concentration," *The New York Times Magazine* (October 8, 1989), p. 26.

tutor. Either go to the campus learning skills center or tutoring office, or find a classmate who has time to help you. In most cases, it won't take long before a tutor will pinpoint your problem, help you work it out, and send you off to tackle the rest of the term on your own.

Join a Study Group Get together regularly with a small group of other students to discuss specific assignments and the course as a whole. During the give-and-take of the discussions, you are bound to learn a great deal; the subject may come alive, or the enthusiasm of some of the members may rub off on you. As you grow more familiar with the subject, your interest level will rise. The only prerequisite for a group meeting is that all members do their homework. Only then can each member become an active contributor.

Pick Out an Alternate Textbook If you're struggling with a course, the textbook, not the subject, may be at the root of your problem. A little investigating at a library or bookstore may turn up books in which other authors discuss the same topics in ways you may find more accessible. After you have consulted some alternative books, read the material in your assigned textbook. The two texts may discuss the same topic, but your class will probably be focusing on aspects and approaches specific to the assigned text.

Use Programmed Materials and Workbooks If your skills don't seem to match the requirements of a course, you may need some extra practice. Programmed materials furnish questions and problems closely followed by their answers, thereby enabling you to teach yourself every incremental step of each lesson. Workbooks provide exercises that apply the ideas explained in your textbooks. Either of these study aids can help minimize the anxiety that arises from feeling uncertain about putting newly learned ideas to use. They can also stimulate your interest by helping you take what you've learned a step further.

Also, try the computer center for programmed materials that are interactive. Drills, practice tests, and simulations are available for many subjects.

Set Realistic Study Goals In some cases when the challenge of your work outstrips your skills, the problem lies with you and is easily remedied. For instance, don't expect to acquire a term's worth of skills in a few marathon study sessions. If up to now you have done little or no studying, change your habits gradually. Start by studying for only two hours on that first evening; then work up to longer sessions in which you'll be able to achieve increasingly large goals.

SUMMARY

What is concentration?

Concentration is thinking that is focused. It occurs when nearly all your thinking energy is devoted to a single subject instead of to a variety of scattered ideas.

How do distractions affect concentration?

Distractions compete for your mind's attention. External distractions, such as loud noises or interesting scenery, or internal distractions, such as nagging worries or vivid daydreams, divert your attention and destroy your concentration.

What is the proper environment for concentration?

The proper environment is a place you use only for studying and use consistently. The area should be relatively free of visual distractions and noise, including music. The area should be brightly and evenly lit to discourage fatigue and prevent eyestrain.

What equipment aids concentration?

Good lights head the list of equipment that encourages concentration. A comfortable chair is important as well. A bookstand can free your hands and keep your textbook in a position that encourages active, focused thinking. Well-stocked and accessible supplies help keep your mind on your work.

What is a concentration scoresheet?

A concentration scoresheet is a tally of the times when your concentration is broken. To keep score, put a check mark on a sheet of paper each time you realize you are no longer concentrating. The check marks will motivate you to keep your mind on your work.

What is a worry pad, and how do you use it?

A worry pad acts as a holding tank for stray thoughts that divert your attention from your studying. Putting these thoughts on paper takes them off your mind until you have the time to focus on them.

What strategies encourage concentration?

Strategies that help promote concentration and reduce the chance that distractions will arise in the first place include making lists, taking breaks, and maintaining a bal-

What is the value of taking a break?

ance between your skills and the level of the material you're learning.

Taking a break can help defuse the distractions—hunger, fatigue, boredom—that commonly accumulate during study sessions.

What is meant by “maintaining a balance”?

This phrase means matching your personal skills to the level of challenge of a particular task. Otherwise, if the challenge overwhelms your skills, you may become anxious. If your skills exceed the challenge, you may become bored. And when both challenge and skills are low, you will probably feel apathetic, and your concentration will drop.

What techniques allow you to maintain a balance and concentrate?

If you find yourself off balance, you have several strategies from which to choose. Find a tutor to help raise your level of skills. Study in a small group to boost the challenge of a course. Search out alternative texts that challenge you if your assigned text seems boring or that set your mind at ease if the text seems intimidating. Use programmed materials and workbooks to test your skills if you're feeling unsure of yourself or to provide an extra challenge when the course seems too easy. Finally, set realistic study goals, which will help keep the challenge within the range of your skill level.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words or phrases listed below each sentence.

1. When you realize you're concentrating, your concentration will be _____.

intensified broken habitualized

2. You'll probably find the most suitable atmosphere for concentration in _____ .
 your room the study hall the library
3. To keep awake during studying, it is important to have _____ .
 a hard-seated chair self-discipline a private room

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-------------------------------|--|
| _____ 1. "Flow" | a. Technique for tuning out external distractions |
| _____ 2. Boredom | b. Encouraged by the concentration score-sheet |
| _____ 3. Spider technique | c. Used to promote interest and raise skill levels |
| _____ 4. Reminder list | d. Can serve as a signal for broken concentration |
| _____ 5. Self-observation | e. Stopgap measure for dealing with internal distractions |
| _____ 6. Check mark | f. Enables you to shift smoothly from one task to the next |
| _____ 7. Worry pad | g. Term that describes an especially rewarding kind of concentration |
| _____ 8. Programmed materials | h. Results when skills exceed the challenge of the task |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. You can't realize you're concentrating while you're concentrating.
- _____ 2. Loud music provides a suitable background for studying.
- _____ 3. In normal circumstances, there are dozens of things competing for your attention.
- _____ 4. Most internal distractions are beyond your control.
- _____ 5. The best way of achieving concentration is by striving for it directly.
- _____ 6. Your study environment will be more effective if you use it for recreation as well.

- _____ 7. Concentration involves achieving a balance between challenges and skills.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Trouble in concentrating is due primarily to
 - a. internal and external distractions.
 - b. boredom.
 - c. anxiety.
 - d. poor eyesight.
2. To promote concentration, your work area should be
 - a. quiet.
 - b. well lighted.
 - c. used only for studying.
 - d. all of the above.
3. When you're studying, music should be considered
 - a. a help.
 - b. a reward.
 - c. noise.
 - d. an internal distraction.
4. Internal distractions are
 - a. disruptions that you create.
 - b. caused by such problems as headaches and indigestion.
 - c. a by-product of concentration.
 - d. encouraged by a comfortable study area.
5. Although concentration is powerful, it is often
 - a. unnecessary.
 - b. elusive.
 - c. underestimated.
 - d. time consuming.
6. When the challenge is high but your skill level is low, you will probably experience
 - a. concentration.
 - b. boredom.
 - c. anxiety.
 - d. apathy.

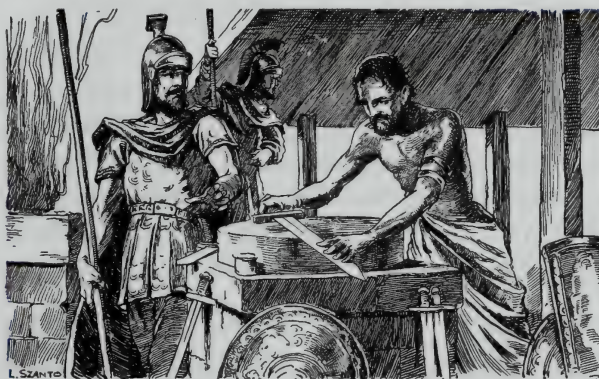
Short answer. Supply a brief answer for each of the following items.

1. What are the two general ways in which concentration can be promoted?
2. How will a tutor help minimize your anxiety and apathy?
3. Explain the conditioning effect that occurs when you use your desk only for studying.
4. What are some ways you can eliminate noise?
5. Discuss how you can use lists to encourage concentration.

THE WORD HISTORY SYSTEM

acumen a-cu'-men *n.* Quickness, accuracy, and keenness of judgment or insight.

Acumen: *the sharpness of the mind*



A keen mind may be likened to a sharp knife, which penetrates easily and quickly. For clean-cut action, both the knife and the mind must be sharp. So it is natural that when a word was needed to denote the faculty of keen, penetrating thought, the Latin word for "sharpness" should be borrowed. *Acuere*, in Latin, means "to sharpen," and *acumen* means "sharpness." English borrowed *acumen* and used it figuratively for sharpness of the mind.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

If I were asked to name the deadliest *subversive* force within capitalism, I would without hesitation name advertising.

—Robert L. Heilbroner (1919–), American economist

1. *subversive* force underlying substantial corruptive

Marketing is merely a civilized form of warfare in which most battles are won with words, ideas, and *disciplined* thinking.

—Albert W. Emery (1923–), American advertising agency executive

2. *disciplined* thinking informed orderly shrewd

Gentility is what is left over from rich ancestors after the money is gone.

—John Ciardi (1916–1986), American poet and critic

3. *gentility* refinement large debts large family

The ideals which have lighted my way, and time after time have given me new courage to face life cheerfully, have been Kindness, Beauty, and Truth. The *trite* subjects of human efforts—possessions, outward success, luxury—have always seemed to me *contemptible*.

—Albert Einstein (1879–1955), German-born American theoretical physicist

4. *trite* subjects concise precise unappealing
5. seemed . . . *contemptible* temporary despicable probable

FORGETTING AND REMEMBERING

Those who cannot remember the past are condemned to repeat it!

—GEORGE SANTAYANA (1863–1952), SPANISH-BORN AMERICAN
PHILOSOPHER

Forgetting is like an ocean wave steadily washing away what you've learned. You can't stop forgetting, any more than you can stop a wave. But you *can* reinforce what you've learned and strengthen your memories in the face of the incoming tide. To aid you in doing so, this chapter focuses on:

- Theories about forgetting
- Pseudo-forgetting
- Principle of selectivity
- Silver Dollar System
- Organizing information
- Remembering with mnemonics
- Value of recitation
- Memory consolidation
- Distributed practice

FORGETTING AND REMEMBERING

Understanding
How We
Forget

Making an
Effort to
Remember

Controlling the
Number and
Form of Your
Memories

Strengthening
Memories

Allowing
Time for
Memories to
Consolidate

Avoid
Pseudo-
Forgetting

Find a
Reason to
Remember

Be Selective
About
What You
Learn

Organize
Information
in a Mean-
ingful Way

Reinforce
New Ideas
Through
Association

Rehearse
Information
Through
Recitation

Use
Short Study
Periods

Accept
Memory
Plateaus

Most of us become annoyed when we realize we've forgotten something crucial or when something "we should have known" has managed to slip our minds. But just how big a problem is forgetting? In the hierarchy of academic woes, forgetting holds sole possession of the summit. It is the biggest single problem you will encounter in school.

UNDERSTANDING HOW WE FORGET

Memory is under constant assault from forgetfulness. Forgetting works both massively and rapidly to undo the work that learning has done. Unfortunately, forgetting's acts of sabotage are extremely successful. After you learn something new, you will forget most of it by the end of the day. Numerous studies and experiments have shown how quickly we forget what we read and what we hear.

In one experiment, people who read a textbook chapter forgot 46 percent of their reading after one day, 79 percent after fourteen days, and 81 percent after twenty-eight days. In other words, subjects could remember only slightly more than half of what they'd read the previous day; after less than a month, the information they were able to retain from their reading had dwindled to 19 percent. Therefore, 80 percent of what they had originally read was now lost.

Not surprisingly, remembering what you have heard is even more difficult than recalling what you have read. After all, as you read you are able to slow down, pause, reflect, and, if necessary, reread. Listeners have no such luxuries; they usually have just one chance to catch the words and ideas being spoken.

For instance, in a classic experiment researchers secretly recorded a seminar held by the Cambridge Psychological Society.¹ Two weeks later, the society members who had attended the seminar were asked to write down all they could recall of it. The results were shocking. More than 90 percent of the points from the lecture had been forgotten or confused with the passage of time. The average proportion of specific points each member correctly recalled was 8.4 percent! Much of what members recalled was at odds with what had actually been said. Events were mentioned that never took place; casual remarks were embellished; points were reported that had only been hinted at. This learned group of psychologists forgot 91.6 percent of the specific points made in the seminar.

¹See Ian M. L. Hunter, *Memory: Facts and Fallacies* (Baltimore: Penguin, 1957), p. 83.

How does this devastating forgetting occur? Although the experts are divided on the answer, they have formulated a number of interesting and plausible theories to explain forgetting (Figure 5.1).

Use it or lose it: Fading theory. According to fading theory, the trace or mark a memory etches in your brain is like a path you make when you

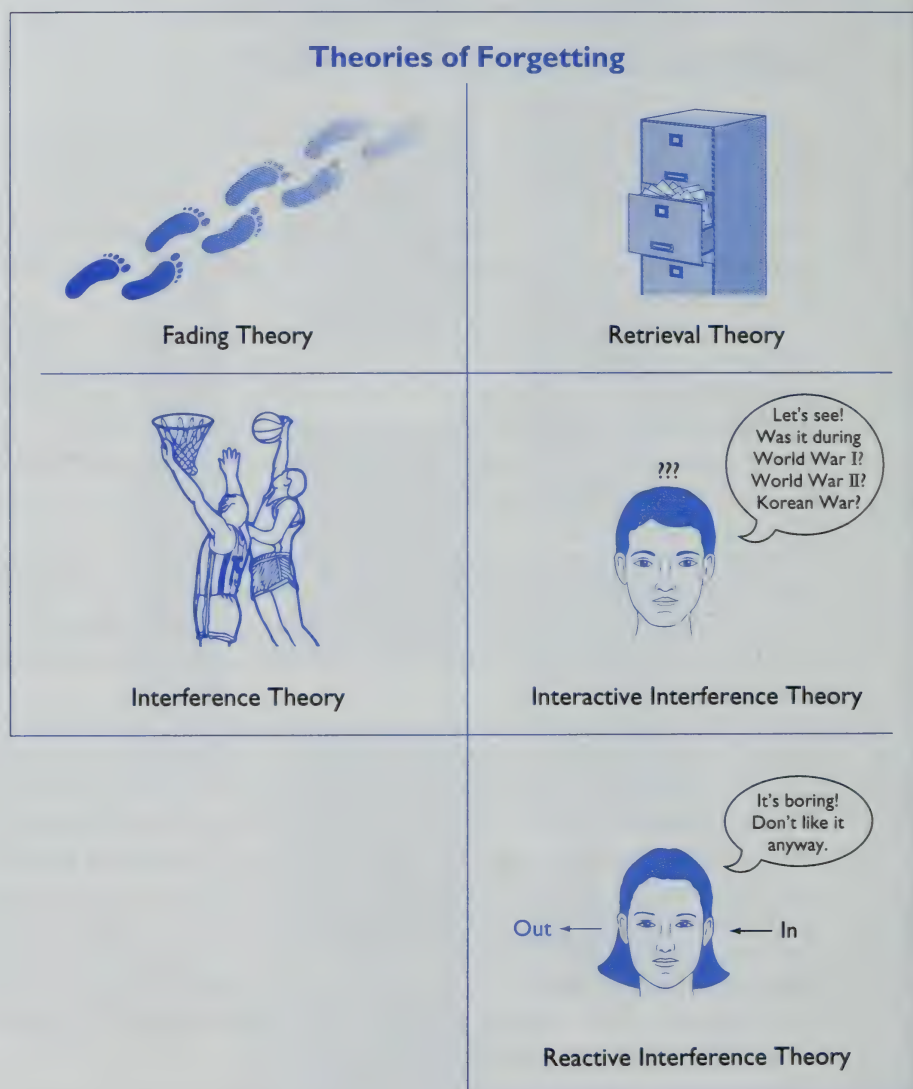


FIGURE 5.1 Theories of Forgetting

walk across a meadow. If you don't continue to walk over the path, grass will grow up and obliterate your trail. In the same way, a fact that's learned but never used will become fainter until it is obliterated completely by forgetfulness.

I know it's here somewhere: Retrieval theory. Unlike proponents of fading theory, some psychologists believe that once a fact or idea is thoroughly learned, it remains a memory for life. According to this retrieval theory, a forgotten fact hasn't faded; it has been misfiled in the vast storehouse of your mind. Whether the information has disappeared completely or has simply been misplaced, the net result is the same: Information you once learned and remembered has now been forgotten.

Fighting for a spot: Interference theory. According to interference theory, limited space puts old and new memories at odds. Memories become like a bunch of competitive basketball players fighting for a spot beneath the basket. Old memories and facts elbow out new information (forward interference), thereby causing us to forget what we've recently learned. Meanwhile, new facts and ideas battle for a coveted position by forcing out facts that we've known for a while (backward interference). The result is a constant battle, with old and new memories both jockeying for position. Some win and some lose.

Caught in a crossfire: Interactive interference theory. Imagine you have learned three facts at three different times. For example:

Oldest: *Photosynthesis* is the process whereby plants employ sunlight to turn chemicals into food.

Middle: A *photomicrograph* is a picture taken through a microscope.

Newest: *Phototropism* is the movement of a plant in response to light.

According to interactive interference theory, you'll lose the middle fact rapidly because it will be bombarded by the oldest learning and the newest learning. To complicate things, the middle fact, fighting for survival, will do its best to bombard the newest and the oldest learning (fighting both frontal and rear attacks). In the course of this fighting, the middle fact, while going down in defeat, will inflict some damage (forgetting) to both the oldest and the newest learning.

Tuning out what you don't like: Reactive interference theory. According to reactive interference theory, your general attitude toward the facts you learn plays a crucial role in whether you will recall them. Facts related to a subject you don't like or find boring can be difficult to understand and even harder to remember. The implications of this theory are clear: Attitude has a noticeable effect on what you are able to learn and remember.

MAKING AN EFFORT TO REMEMBER

To remember something, you have to make a conscious effort to learn it. If you don't learn new information in the first place, it isn't really yours to forget. And even if you do learn new information, it won't stay with you very long unless you're convinced that it's worth hanging on to. The effort you initially make determines whether you'll remember for a lifetime what you've heard or read or forget it in a matter of seconds.

Avoid Pseudo-Forgetting

Whenever you cannot remember a name, a telephone number, a fact, an idea, or even a joke, it's quite natural to say, "I forgot." Yet forgetting may not have anything to do with your problem. You may never have learned the information in the first place. As the poet Oliver Wendell Holmes succinctly put it, "A man must *get* a thing before he can *forget* it."

If you are introduced to someone but don't hear that person's name, it's only natural that the name will slip your mind. You didn't forget it. You pseudo-forgot it. The word *pseudo* means "false" or "phony." Thousands of instances we blame on forgetting are actually a result of this "phony forgetting."

If an idea or a fact is to be retained in your memory, it must be impressed on your mind clearly and crisply at least once. A record of that idea or fact must be laid down in your brain before you can truly recall or forget what you've learned.

Find a Reason to Remember

If you can find a reason for holding on to information you've learned, you have a much better chance of remembering it. In a carefully designed study, researchers showed how intention can influence the life span of a memory. Two groups of students were given identical material and asked to master it. The only difference was that those in the first group were told they had to remember the material for only a single day, whereas those in the second group were instructed to master the material for recall after two weeks.² The difference in intention had a noticeable effect. Although the two groups studied the same material in a similar fashion, after two weeks the students who had intended to remember over the long term retained more than the students who had intended to hang on to what they had learned for only a day.

²H. H. Remmers and M. N. Thisted, "The Effect of Temporal Set on Learning," *Journal of Applied Psychology* 16 (June 1932): 257-268.

Psychologists agree that to learn something thoroughly, you have to be properly motivated. Indeed, a strong motivation can have a surprising effect on your memory. A basketball coach at Cornell University recalled that although as a student at DePauw University he had first found physics uninteresting, his attitude changed when he encountered material dealing with angles, trajectory, and force. He used this information to better understand how basketballs carom off the backboard. Because of his new-found interest, he was able to raise his grade from a C to an A by the end of the semester. What was his reason for remembering? Information from physics, a subject he had once dreaded, could be applied to basketball, a sport he loved.

Of all the sources of motivation, interest is the strongest. If you could study every one of your subjects with motivated interest, you would not have to worry about your final grades. When you are naturally interested in a subject, you have no problem. If, however, you are not naturally interested, try to combat boredom by artificially creating interest. Once you begin to learn something about a new subject, the chances are great that you will find it genuinely interesting. Use the power of interest to work *for* you, not against you.

Whether genuine interest or simple academic survival serves as your motivation, when you hear or read information you want to hold on to, there are ways to strengthen your intention to remember, so that what you've learned will be recalled:

Pay attention. If you're distracted while you're trying to learn, it's unlikely you'll remember anything. Therefore, make a point of minimizing distractions as you read your assignments or listen to lectures.

Get information right the first time. False ideas and misunderstood facts can hang on as tenaciously as information you learn correctly. Therefore, it pays to be attentive when you learn something new. For example, many people incorrectly pronounce the word *nuclear* (NEW-clee-er) as "NEW-cue-ler." One look at the word shows you that this pronunciation is incorrect. But if you learn a word incorrectly, you'll have difficulty replacing the old memory with the correct pronunciation. If you learn something correctly in the first place, you'll have no bad habits to break.

Make sure you understand. Ideas that aren't clear to you when you read or hear them won't miraculously jell and become clearer in your memory. You cannot fashion a lucid, correct memory from a fuzzy, poorly understood concept. Therefore, don't hesitate to ask the instructor to explain any point that you are not clear on. And don't be reluctant to read and reread a passage in your textbook until you're sure you fully grasp its meaning.

Interestingly, the same motivation that enables you to remember can also help you forget. Recall that reactive interference theory suggests we have a tendency to “tune out” information that bores or bothers us. But motivated forgetting can be used positively to clear your mind of information you no longer need to retain.

This conscious intention to forget is well demonstrated by servers in restaurants. They exhibit a remarkably good memory for what their customers have ordered up to the moment the bill is paid. Then experienced servers jettison the entire transaction from their minds and give their full attention to the next customer. Just as they intend to remember, so they intend to forget.

Dr. Hans Selye, a pioneer in stress management, explained how he used motivated forgetting to help minimize the anxiety caused by an overburdened memory:

I make a conscious effort to forget immediately all that is unimportant and to jot down data of possible value (even at the price of having to prepare complex files). Thus, I manage to keep my memory free for facts which are truly essential to me. I think this technique can help anyone to accomplish the greatest simplicity compatible with the degree of complexity of his intellectual life.³

This idea of intending to forget explains why Albert Einstein, unquestionably one of the great minds of the twentieth century, was nonetheless unable to provide his home telephone number from memory. Although the famous physicist’s forgetfulness may have seemed like absent-mindedness to some, it was usually deliberate. Einstein used his exceptional brain as the incubator for ideas and theories that fundamentally changed the way we view the world. He saw no point in clogging his mind with simple numbers that could easily be stored in an address book; therefore, he purposely forgot them.

CONTROLLING THE NUMBER AND FORM OF YOUR MEMORIES

The forgetting that many of us practice instinctively seems to imply that there is a limit to how much we can remember at once. In 1956 psychologist G. A. Miller produced scientific support for this notion. In his article “The Magical Number Seven, Plus or Minus Two,” Miller points out that most people are able to hold only seven items in short-term memory at one time. The size of each item, however, can be virtually unlimited as long as

³Hans Selye, *The Stress of Life* (New York: McGraw-Hill, 1956), p. 269.

the information in it is meaningfully organized. For example, you couldn't expect to remember the following thirty-one items:

aabceeeeeeiilmnnnoorrrsstuvy

But if you organized these items in a meaningful way—as words—you could reduce the number of items to seven and increase your odds of remembering them:

You can learn to remember seven items.

1 2 3 4 5 6 7

As Miller explains, "Our language is tremendously useful for repackaging material into a few chunks rich in information."⁴

The lesson to be learned from Miller's research is this: Improve your chances of remembering by being selective about what you learn and by making sure that what you do choose to remember is meaningfully organized.

To emphasize the importance of Miller's seminal article, hear what Jerome Bruner, a prominent psychologist and former director of Harvard University's Center for Cognitive Studies, has to say:

I think if there were a retrospective Nobel Prize in Psychology for the mid-1950s, George Miller would win it hands down—and on the basis of one article, "The Magic Number Seven, Plus or Minus Two."⁵

Reading Bruner's evaluation, I immediately reread Miller's article several times to absorb as much of his argument as possible and to reflect on its implications.

Be Selective About What You Learn

Long before Miller's discussion of the "magical number seven," Hermann Ebbinghaus (1850–1909), a German psychologist, had spent more than twenty years investigating forgetting and the limits of memory. In his most famous experiment, Ebbinghaus counted the number of trials required to learn a series of six nonsense syllables (such as *bik*, *luf*, *tur*, *pem*, *nif*, and *wox*). He then counted the number of trials required to learn a series of twelve such syllables. Ebbinghaus's tabulations yielded surprising results: The number of trials required to memorize the twelve syllables was fifteen

⁴G. A. Miller, "The Magical Number Seven, Plus or Minus Two: Some Limits on Our Capacity for Processing Information," *Psychological Review* 63 (March 1956): 81–97.

⁵Jerome Bruner, *In Search of Mind* (New York: Harper & Row, 1983), p. 97.

times greater than the number required to learn the six syllables.⁶ So, for example, if it took four minutes to memorize six syllables, it would take an hour to memorize twelve.

Although Ebbinghaus dealt only with nonsense syllables, his careful research teaches us a valuable lesson that can be applied to both textbook and lecture material: To improve your chances of remembering what you've learned, you must condense and summarize. In practical terms this means picking out the main ideas from your lecture and textbook notes and leaving the supporting materials and examples aside. Once you have selected the important points from what you've read, you should be able to memorize them in a manageable amount of time.

Of course, reducing pages and pages of notes to just a handful of main ideas is often easier said than done. If you need a painless method of extracting the highlights from your notes, consider the *Silver Dollar System*.

The Silver Dollar System

Read through your notes and make an *S* in the margin next to any idea that seems important. Depending on the number of pages of notes you read, you'll probably wind up with several dozen *S*'s.

Now read only the notes you have flagged with an *S*. As you go through these flagged notes for a second time, select the ideas that seem particularly important, and draw a vertical line through the *S*'s that are next to them. Your symbol will look like this: *\$*.

Make a third and final pass through your notes, reading only those ideas that have been marked *\$*. Out of these notes, mark the truly outstanding ideas—there will be only a handful of them—with another vertical line so your markings look like dollar signs: *\$*

The Silver Dollar System shows you at a glance which ideas are crucial to remember and which are not. The *\$* sign alerts you to the truly important ideas, the "Silver Dollar" ideas that should receive most of your attention. Next come the *\$* ideas; they are worthy but shouldn't clutter up your memory if you have a lot to remember in a limited amount of time. Finally, the *S* ideas can be ignored. Although you flagged these as potentially important ideas, since then you've twice marked ideas that were even more important.

In normal circumstances, deciding what's important can be a time-consuming and even frightening experience. It requires real courage to select just a few ideas from pages and pages of notes and ignore the rest. With this system, you can select the Silver Dollar ideas gradually and relatively easily.

⁶Matthew High Erdelyi, "Commentary: Integrating Dissociations Prone Psychology," *Journal of Personality* 62, no. 4 (1994): 669–680.

Organize Information in a Meaningful Way

The papers on your desk are easier to keep track of if you organize them into groups and put them into several file folders. A textbook is easier to understand because the information in it has been divided into chapters. A single item is easier to find in a supermarket because the products have been grouped together and arranged in different aisles. If you had to look for a jar of peanut butter in a supermarket where the items were randomly placed, you might give up the search.

The same idea applies to memories as well. If the material you try to remember isn't well organized, you'll have trouble remembering it. But if you organize information in a meaningful way, you'll have a much easier time recalling it.

When you have a large list of items to remember, try to cluster similar items around a natural heading or category. Once clustered and categorized, the items will resist the decaying power of forgetting. Just as the stem holds together the individual grapes, so categories and clusters hold together individual facts and ideas.

This hanging together is especially useful during an exam: Remembering one item from a cluster is usually the key to remembering all the items. For example, it would take a long time to memorize by rote the following words, which you might encounter in a geology course:

slate	diamond	sapphire
bronze	lead	aluminum
iron	marble	silver
emerald	steel	brass
gold	limestone	ruby
granite	platinum	copper

But when these words are organized into categories and are clustered as shown in Figure 5.2, memorization is relatively easy and remembering is strong.

STRENGTHENING MEMORIES

The stronger a memory is, the longer it lasts. If you reinforce new ideas by connecting them to ones already in your memory, and if you conscientiously rehearse what you've learned, that result should be strong enough to stand up to forgetting.

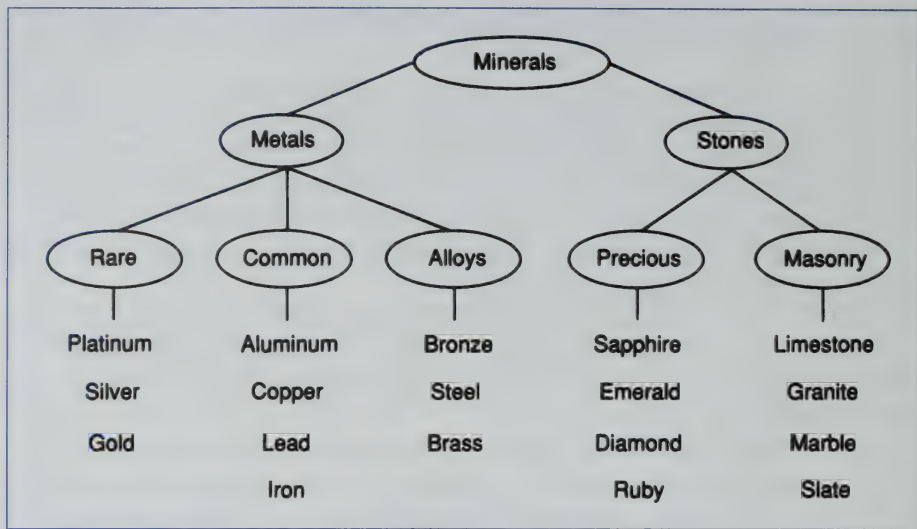


FIGURE 5.2 The Category and Cluster System of Organizing Items

Figure from *Psychology: An Introduction, Fourth Edition* by Jerome Kagan and Ernest Havemann. Copyright © 1980 by Harcourt, Inc., reproduced by permission of the publisher.

Reinforce New Ideas Through Association

That famous line “No man is an island” applies to memories as well. An idea that stands alone is not likely to be recalled because the ideas you remember are woven into a network that connects a single memory with hundreds and often thousands of other memories. The more connections there are in the network and the stronger those connections are, the better the chance for recall is.

Sometimes these connections are made automatically. Most people easily recall, for example, where they were and what they were doing when they learned that President Kennedy had been assassinated in 1963 or when the space shuttle *Challenger* exploded in 1986. In these cases, you instantly connect the memory of the event with the memory of where you were.

But in normal circumstances, relying on your memory to automatically make these connections is risky. If you want to improve your chances of remembering something, you must make a real effort to link what you’ve learned to your memory network. You can strengthen the staying power of information when you add it to your memory by consciously making either logical or artificial connections.

Make Logical Connections Consider how you can recall the written directions to a friend's house by keeping in mind a map you once saw of the location or strengthen your memory of the bones of the body by recalling a diagram of a human skeleton. These are examples of logical connections you make to improve your recall. The best ways of strengthening your memory network through logical connections are building on your basic background and using images to support whatever it is that you're trying to remember.

Build on your basic background. The principle behind basic background is simple but powerful. Your understanding and memory of what you hear, read, see, feel, or taste depend entirely on what you know, on what you already have in your background. Some of this information has been with you for years, whereas other parts of it may be just seconds old. When listening to a speaker, you understand his or her points as long as you can interpret them in light of something you've already learned. When you make connections this way, you increase the power of your memory.

Here are some concrete steps to help you build a solid background:

Give basic courses the attention they deserve. Many students make the mistake of thinking that the basic courses they take in their first year of college are a waste of time. Yet these introductory courses create the background essential for all the courses that follow. Indeed, each student's professional life begins with first-year courses.

Make a conscious attempt to link what you learn to what you already know. When you learn something new, ask yourself questions such as "How does this relate to what I already know?" and "How does this change what I already know?"

Ask an instructor to explain what you don't understand. At times an entire class can hinge on a single point. Miss that and you miss the purpose of the class. Don't feel hesitant or shy about asking an instructor to go back over a point you can't quite get a fix on. After all, the instructor is there to help you learn.

Strengthen memories with pictures. Another way of reinforcing what you've learned is by creating a picture of it. Whether you draw the new information on paper or simply visualize it in your mind, you add an extra dimension to your memory. After all, only one-half of your brain thinks in words; the other half thinks in pictures. When you convert words into pictures, you are using both sides of your brain instead of just one.

A student who attended a lecture on amoebas included a sketch of this one-celled organism in her notes (see Figure 5.3). The combination of

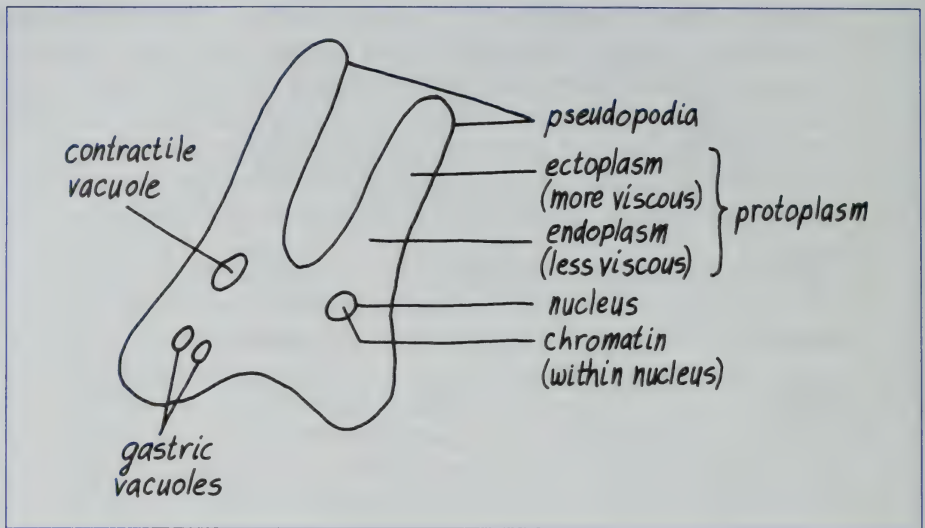


FIGURE 5.3 Structure of the Amoeba

words and picture gave her a clearer understanding of the subject than she would have gained from relying exclusively on written information. When a question about amoebas appeared on a test, the student handled it easily by recalling the picture she had drawn.

Even when material doesn't lend itself to drawing, you can still devise a mental image. According to Dr. Joseph E. Shorr of the Institute of Psycho-Imagination Therapy in Beverly Hills, California, "The human memory would be worthless without the capacity to make mental pictures." Almost any memory can be turned into a mental image. If you need to remember, for example, that Abraham Lincoln was born in 1809, you can picture a log cabin with "1809" inscribed over the doorway. The image you recall doesn't have to be especially detailed; it only has to be strong enough to jog your memory. (Chapter 13 provides a detailed discussion of how to tap into your natural ability to think visually.)

Make Artificial Connections Strong connections don't always have to be natural or logical ones. They can be completely artificial. After all, what natural link is there between the word *face* and a group of musical notes? Yet many beginning music students rely on this word to help them recall the notes written in the spaces of the treble clef (F, A, C, E). Such connections are by no means limited to music.

Suppose you have just been introduced to a man named Mr. Perkins. To remember his name, you immediately associate it with a coffeepot *perk-*

ing. You even visualize the perking pot and smell the aroma of freshly brewed coffee.

What you have done is tie *new* information (Mr. Perkins) to *old* information (perking coffeepot) that is already well established in your memory. When you meet Mr. Perkins at some future time, you will recall the perking coffeepot, which will prepare you to say, "Hello, Mr. Perkins. Nice to see you again."

The majority of memory tricks (known as *mnemonic devices*) rely on such artificial connections.

Use classic mnemonic devices. Nearly everyone employs at least one or two mnemonic devices to recall specific hard-to-remember facts and information. Probably the most widely used mnemonic device is the old jingle by which many of us keep track of the irregularities in the calendar:

Thirty days hath September,
April, June, and November.
All the rest have thirty-one,
Except February alone.

Rivalling this days-in-the-month mnemonic is one for spelling:

i before *e* except after *c*
or when sounding like *a*
as in *neighbor* and *weigh*

Many people have their own personal mnemonics, such as "Surround the *r* with *a* for the word *separate*."

As we've already learned, the cardinal rule for dealing with masses of information is to make sure that information is organized in a meaningful way. A mnemonic device is an organizational system pure and simple. It is an ordinary means to an important end. Gerald R. Miller conducted a study to evaluate the effectiveness of mnemonic devices as aids to study.⁷ He found that students who used mnemonics raised their test scores by as much as 77 percent!

Miller recognizes that the use of too many mnemonics can overload the memory. Nevertheless, he argues that learning a large number of mnemonics well creates no greater hazard for a student than learning a large amount of material in the traditional way. Here's a sampling of some classic mnemonics that you may have encountered:

Spelling. The greatest number of mnemonic devices are aids to spelling. Here's how to remember the correct way to spell two words that confuse many students:

⁷Gerald R. Miller, *An Evaluation of the Effectiveness of Mnemonic Devices as Aids to Study*, Cooperative Research Project no. 5-8438 (El Paso: University of Texas Press, 1967).

A principal is a pal.

A principle is a rule.

If you use classic mnemonic devices to help yourself recall information, make certain you memorize the sentence, word, or jingle thoroughly. The slightest error can throw you off completely. For example, some algebra students use the FOIL method to remember the order for multiplying a binomial: First, Outer, Innner, Last. But if you recall the wrong word instead, say FILE, you wind up hopelessly confused.

Biology. The first letters of the words in the following sentence stand for the major categories and subdivisions of the animal world—kingdom, phylum, class, order, family, genus, species, variety:

Kings Play Cards On Fairly Good Soft Velvet.

Geography. Remembering the names of the Great Lakes is easy if you keep HOMES in mind, but recalling the lakes in a particular order is not so easy. Here's a mnemonic device that organizes them from west to east (Superior, Michigan, Huron, Erie, Ontario):

Super Machine Heaved Earth Ot.

History. The royal houses of England (Norman, Plantagenet, Lancaster, York, Tudor, Stuart, Hanover, Windsor) are difficult to remember without the help of a mnemonic device:

No Plan Like Yours To Study History Wisely

Medicine. Even doctors and pharmacists use memory systems to help keep certain chemicals straight. To distinguish between cyanates, which are harmless, and cyanides, which are extremely poisonous, they use this device:

-ate, I ate; -ide, I died.

Medical students are expected to remember massive amounts of information. Often, a mnemonic comes to the rescue. Some med students use the word SKILL to help themselves recall the body's excretory organs:

Skin Kidneys Intestines Liver Lungs

Devise your own mnemonics. Associating new information logically is generally better than doing so artificially, and truly knowing something is always better than using a system to remember it. But if you're required to learn facts that you can't connect with your memory network and that have no classic mnemonic, you may want to invent your own mnemonic device to help yourself remember.

*Keyword mnemonic.*⁸ Connecting a man named Perkins with a perking coffeepot provides a good example of a *keyword mnemonic* in action. The procedure for devising a keyword mnemonic has two steps, a verbal step and a visual step.

1. *The verbal step.* Find a familiar word or a phrase that sounds like the word you are trying to remember. This is your keyword. For the name *Perkins* the keyword is *perking*.
2. *The visual step.* Connect your keyword with what you want to remember. For example, form a mental image of Mr. Perkins's face on a perking coffeepot. Then when you see him again, you'll recall that image, which will remind you of his name.

The keyword system isn't limited to helping you remember the names of people you meet. It also comes in handy for remembering vocabulary words from a foreign language. For example, if you want to recall the French word for "butter," *beurre*, connect it with a keyword like *burr*, or *brrr*, and then link the two with a visual image, a pat of butter covered with burrs or a stick of butter wearing a parka and shivering (brrr!).

Create-a-word mnemonic. The letters of a "created" word can be used to help you remember important information in the same way the classic mnemonics FACE and FOIL are used. Here's an example: The task is to devise a mnemonic that will enable you to recall five guidelines for preventing heart attack and stroke.

1. After age forty, get a medical checkup every year.
2. Do not smoke.
3. Keep your weight down.
4. Exercise moderately and wisely.
5. Get sufficient rest.

To devise a *create-a-word mnemonic*, proceed as follows:

1. Underline the keyword in each item (as has been done in the previous list).
2. Write down the first letter of each keyword. (Here we have A, S, W, E, and R.)
3. Create a word or several words from the first letters of the keywords. Change the order of the letters as necessary to do so. (Here we can make SWEAR, which will help us recall the five keywords: Smoke, Weight, Exercise, Age forty, Rest.)
4. If possible, make a link between your keyword and the idea for which

⁸The keyword mnemonics section is based on a discussion in K. L. Higbee, *Your Memory: How It Works and How to Improve It*, 2nd ed. (New York: Prentice-Hall, 1988).

it acts as a mnemonic. ("If you want to reduce your risk of heart attack or stroke, you must *swear* to do the following.")

Your mnemonic may be a real word or a word you just made up. If you use a made-up word, be sure you will be able to remember it.

Create-a-sentence mnemonic. This is a variation on the create-a-word mnemonic. In fact, most of the steps are the same. A *create-a-sentence mnemonic* is devised as follows:

1. Underline the keyword in each main point in your notes.
2. Write down the first letter of each keyword.
3. Construct an easy-to-remember sentence using words whose first letters are the same as the first letters of the keywords.
4. Devise a sentence that relates to the information you want to remember.

As an example, here are eight main points taken from a long article about what to do if you are in a building that is on fire. The keywords have been underlined.

1. Feel the door with your hand. If it is hot, the room or hall on the other side is on fire.
2. If the door is cool, check the air coming under the door. If it is cool, then there's probably no fire on the other side.
3. Even so, don't take chances. Open the door just a crack while kneeling with your face turned away. Listen and smell for fire and smoke.
4. When you leave, shut all doors and windows.
5. If your room is smoke-filled, crawl with your nose about one foot from the floor.
6. Never use an elevator; use a stairway.
7. If you are trapped, use wet cloths to protect your face, hands, and breathing passages.
8. Hang something out of a window to attract attention.

The first letters of the keywords are D, A, C, S, C, S, W, and H. An easy-to-remember sentence using words beginning with the first letters of the keywords is

Dry Air Creates Sparks, Causing Smoke Within Houses.

The letters need not appear in the same order as the keywords. But in this case, the sequence of steps was considered important, so the original order was retained.

In general, creating a simple sentence is easier than taking the first letters from your keywords and turning them into a word or two, especially if the order of the points has to be maintained. Of course, if the initial letters are mainly consonants, both methods can be difficult. To circumvent the

problem of having too many consonants, choose some keywords (or synonyms of the keywords) that begin with a vowel.

Employ commercial memory methods. Most commercial memory courses rely on the *peg*. This system for memorizing items in sequence employs a master list of words that act as hooks or pegs on which to hang the information you want to remember. A peg word often rhymes with the number it stands for. For example, one is bun, two is shoe, three is tree, and four is door. To remember a group of items, you associate them with the peg words, often by employing bizarre images.

For example, if you want to remember a shopping list consisting of butter, sugar, and sausage, you might visualize a pound of butter melting atop a gigantic bun, a shoe filled with loose sugar, and a sausage as tall as a tree. Then when you arrive at the supermarket, you run through the peg words in sequence (bun, shoe, tree) and recall the words with which each is associated.

The peg may work for buying groceries but not for doing schoolwork because the system assumes you'll be able to memorize the original list. When you are unable to do this, the entire system falls apart. In addition, the peg works with only one list at a time, it may cause interference, and it does little to reinforce information in your long-term memory. Commercial memory courses do have some value, and peg words can help out in a pinch, but in general the cost of the courses outweighs their usefulness, and the techniques are better for survival than success.

Rehearse Information Through Recitation

No single activity is more important in strengthening your memory than recitation. That's because recitation forces you to think seriously about what you've read or heard. This deep thinking (experts call it *deep cognitive processing*) is the key to making memories last.

To reap the benefits of recitation, you need to know how to recite. But it also helps to understand how reciting strengthens your memory and why reciting is more effective than rereading.

Learn How to Recite Most students have only a vague idea of what reciting involves. Others more familiar with reciting incorrectly assume that there is only one method of doing so. Although there is a traditional method of reciting, if you follow some basic guidelines, you can recite in several ways. In fact, the best method of reciting is not the best known.

Do traditional reciting. Traditional reciting involves restating information out loud, in your own words, and from memory. For example, if you read

a paragraph from a textbook, look away, and then explain the meaning of what you have just read, then you are reciting.

Unfortunately, not all students are keen on this kind of reciting. Some feel that the process is strange or unnatural, like talking to themselves. Others are reluctant to recite in a quiet place where people are studying. Still others are embarrassed to be heard reciting no matter what. As a result, many students don't recite. But there are other ways to recite that avoid such embarrassments. The trick is to stick to the basics of reciting.

Understand the process of reciting. All reciting follows three basic steps: You *read*, you *convert* what you've read, and then you *test* yourself on what you've learned. A simple way to recall these steps is to think of the consonants in the word *recite*. The *R* stands for read, the *C* for convert, and the *T* for test.

1. *How to read.* Read one paragraph at a time if you're reciting from your textbook or one note at a time if you're reciting from your note sheets. In each case, extract the main idea as you do so. If you're reciting from your notes, your job is a breeze: The main idea is the note you wrote down. If you're reading from your textbook, remember that each paragraph typically contains just one main idea, which all the other sentences support.
2. *How to convert what you've read.* Once you've read the paragraph or note and extracted the main idea, convert this main idea into a keyword or two that hint at the idea or a question that uses the idea as its answer.
3. *How to test yourself.* Use the keywords or the question you've devised to demonstrate out loud or on paper your knowledge of the main idea.

Recite by writing out questions and answers. The best way to recite is by converting what you've read into questions, reading those questions, and then writing down answers. Converting ideas into questions is usually more effective than coming up with a keyword or two. In addition, writing down answers on paper provides better practice than simply stating those answers out loud.

The difference between using keywords and asking questions is basically the difference between recognizing and recalling. Recognizing a correct answer will always be easier than recalling one without any clues. Keywords "cheat" by enabling you to recognize part of the answer, whereas questions emphasize recall. With no clues to go on, if you can answer your question, you have probably recalled the right answer and not simply recognized it. And because most of the answers you'll be asked to give on tests and quizzes will be written, not spoken, this kind of reciting provides excellent practice for test taking.

When done properly, reading out loud can be an excellent way of reciting. But some students who are reluctant to recite out loud either skip the

reciting step altogether or mumble instead of speaking clearly. Reciting under your breath makes it too easy to convince yourself that you know the correct answer when you don't. But when you do your reciting by writing, you have solid proof that you can answer your questions.

Understand Why Recitation Works Whether you recite by speaking or by writing, the effect on your memory is basically the same. Recitation strengthens the original memory trace by prompting you to think actively about the new material. The physical activity of thinking, pronouncing, and hearing your own words involves your body as well as your mind in the process of learning. The more physical senses you use in learning, the stronger the memory in your brain will be. In addition, recitation provides a number of psychological benefits that improve your ability to learn and remember.

Recitation gets you involved. Reading is not the same as comprehending. It's possible, for example, to read a book aloud to a child without paying attention to the story. Likewise, if you're having a tough time concentrating, you can read every word on a page and still not recall what you've read. To truly comprehend what you've read, you need to know both what the words *say* and what they *mean*. When you recite, you make yourself stop and wonder, "What did this just say?" You're transformed from a detached observer into a participant.

Recitation provides feedback. Reciting not only gets you involved in your reading, it also demonstrates how involved you are. Rereading can give you a false and dangerous sense of confidence. It takes a lot of time and leaves you with the feeling that you've been hard at work, yet it provides no concrete indication of what you're learning. When test time comes, you may blame your mental blanks on test anxiety or on unfair questions when the real culprit is ineffective studying.

Unlike rereading, reciting lets you know right away where your weaknesses lie. You find out at the end of every paragraph whether you understand what you've just read. This gives you a chance to clarify and solidify information on the spot, long before you're tested on it.

Recitation supplies motivation. Because it gets you involved and checks your progress regularly, recitation provides motivation for studying. And motivated interest promotes stronger memory.

If you struggled to extract the information from a paragraph you just read, you may be motivated to get the point of the next paragraph more easily. If you had no trouble finding the meaning in that paragraph, then the momentum of your reading may serve as a motivation.

Recognize the Difference Between Reciting and Rereading Students who don't recite usually reread their notes or chapter assignments until they feel they "know it." They do this in the hope that repetition will lead to comprehension. Unfortunately, any real learning that takes place through rereading usually occurs by accident. This all-too-common study method really does little to strengthen memory.

Recitation, however, works in several ways at once to help improve the chances that you'll remember what you've learned. Recitation gets you involved. It provides immediate feedback so you can test yourself and check your progress. It motivates you to keep on reading.

ALLOWING TIME FOR MEMORIES TO CONSOLIDATE

The fact that recitation helps new information to jell hints at another aspect of memory: New ideas don't instantly become a part of your memory. Your memory needs time to consolidate what you've learned.

A dramatic illustration of the memory's need to consolidate comes in a story of a mountain climber who fell and hit his head. Although the man was not permanently injured, he couldn't remember falling. In fact, he couldn't recall anything that had happened to him in the fifteen minutes *before* the accident. Why not? According to the principle of consolidation, the climber's memories before the accident had not had a chance to consolidate. As a result, when the climber hit his head, those unfinished memories were lost.⁹

This principle helps explain why in most cases the most effective way to study is in short blocks of time instead of in one long stretch. An understanding of consolidation will help you live through those frustrating times when you don't seem to retain what you're studying.

Use Short Study Periods

In *distributed practice*, you engage in relatively short study periods broken up by rest intervals. In *massed practice*, you study continuously until the task is completed. A number of studies have demonstrated that several short "learning sprints" are more productive than one grueling, long-distance study session.

In an extensive experiment, researchers D. Krug, T. B. Davis, and J. A. Glover examined the effects of massed and distributed practice on a read-

⁹R. S. Woodworth and H. Schlosberg, *Experimental Psychology*, rev. ed. (New York: Holt, Rinehart & Winston, 1954), p. 773.

ing comprehension task and found that distributed practice led to better performance.¹⁰

Bertram Epstein used two experimental groups to find out whether distributed practice had an effect on retention.¹¹ One group studied in bite-sized stretches with rest periods in between (distributed practice), while the other worked in one long session with no rests (massed practice). Both groups were tested immediately after studying as well as two weeks and then ten weeks later. After the study was completed, Epstein concluded that distributed practice was superior to massed practice for both immediate and long-term retention.

The memory's need to consolidate information seems to play a key role in explaining why distributed practice is superior to massed practice. But there are other advantages as well that support these bite-sized study sessions:

Periodic "breathers" discourage fatigue. They refresh you both physically and emotionally.

Motivation is stronger when you work in short blocks of time. The end of each session marks a minivictory that provides momentum and a sense of accomplishment.

Distributed practice wards off boredom. Uninteresting subjects are easier to take in small doses.

In spite of all the advantages of distributed practice, massed practice is superior in a few cases. For instance, when you are writing the first draft of a paper, massed practice is often essential. You have organized your notes in stacks, discrete bits of information are waiting in your mind like jigsaw puzzle pieces to be fitted together, and the organizational pattern of your paper, though dimly perceived, is beginning to take shape. To stop working at this point would be disastrous. The entire effort would collapse. So in such a circumstance, it is far more efficient to overextend yourself—to complete that stage of the process—than to take a break or otherwise apply the principle of distributed practice.

New Research Supporting Distributed Practice

The theories of remembering and forgetting discussed here were put forth by psychologists to explain the causes of remembering and forgetting. They are, of course, mere theories.

¹⁰D. Krug, T. B. Davis, and J. A. Glover, "Massed Versus Distributed Repeated Reading: A Case of Forgetting Helping Recall?" *Journal of Educational Psychology* 82 (1990): 366–371.

¹¹Bertram Epstein, *Immediate and Retention Effects of Interpolated Rest Periods on Learning Performance*, Contributions to Education no. 949 (New York: Bureau of Publications, Teachers College, Columbia University, 1949).

Now, biochemists have stepped into the picture. They are experimenting with mice, sea slugs, and fruit flies to produce a drug to bolster the formation of long-term memory in the remaining healthy brain cells of patients with Alzheimer's disease.

They have discovered the two proteins in the nerve cells that control remembering and forgetting. The "activator" protein governs the conversion of the learned information from short-term memory to long-term memory. The "repressor" protein inhibits the formation of long-term memory. Why inhibits? To save the brain from intolerable memory overload.

Now, to the experiment: When the "repressor" was released, the flies completely failed their test of long-term memory. When the "activator" was turned on, "the flies formed long-term memory after only one training session, instead of the usual 10."¹²

The biochemists are getting closer to a solution—at least experimentally. But in the real world of mice, sea slugs, fruit flies, and perhaps humans, the "repressor" and the "activator" are both working simultaneously to gain ascendancy over each other. So, for a drug to be successful for patients with Alzheimer's disease, it has to inhibit the "repressor" protein so that a new "activator" drug can do its job.

As a student, you might say, "Very interesting; but how can I use this information to improve my memory?" Good question! Well, here is part of the answer: When the biochemists stopped conditioning the flies and let them rest, this happened: During periods of rest, the "repressor" protein decayed faster than the "activator" protein. This condition gave the "activator" the upper hand, and a great deal of information in the short-term memory was converted into long-term memory. This biochemical activity awakened the "repressor" and quickly caused a stalemate. So, in essence, the "repressor" and the "activator" are in constant battle.

Now for the rest of the answer: As you study, take frequent very short rests or pauses. These pauses will give your "activator" a chance not only to transfer more data from the short-term memory into the long-term memory, but also to *consolidate* these data and information within the long-term memory. Consolidation leads almost to retention for life.

Accept Memory Plateaus

No two people learn at exactly the same rate, yet the learning patterns of most people are quite similar. We all experience lulls in our learning. Progress is usually slow and steady at first, but then for a period of time there might be no perceptible progress even though we are making a gen-

¹²Neil Ulman, "Fruit-Fly Gene: Clue to Human Memory," *The Wall Street Journal*, Eastern Edition, Issue 227, No. 41, Feb. 28, 1996, p. B1.

uine effort. This “no-progress” period is called a *plateau*. After days, weeks, or even a month of effort, suddenly a surprising spurt in learning occurs and continues until another plateau is reached.

When you reach a plateau, do not lose heart. Plateaus are a normal part of learning. You may not see any progress, but learning is occurring nevertheless. Once everything is in place, you’ll be rewarded for your effort.

SUMMARY

How powerful is forgetfulness?

Forgetting works quickly and thoroughly to rob you in less than a day of much of the new information you’ve read or heard. As time goes on, the forgetting continues.

What causes forgetting to occur?

Experts propose several theories about why we forget. Fading theory says that rarely used information fades away. Retrieval theory argues that forgotten information is misplaced. Interference theory contends that old and new memories interfere with each other. Interactive interference theory suggests that the middle memories are squeezed out by older and newer memories. Reactive interference theory maintains that you tune out and consequently forget information you don’t want to know.

What is pseudo-forgetting?

Pseudo-forgetting is false forgetting. It occurs when you fail to learn something in the first place.

Does having a reason to remember affect your memory?

Yes. A study showed that simply intending to remember can significantly increase the life span of a memory. There are numerous examples of people who are motivated to remember and then do so. Of these motivations, the most effective one is interest.

How can you strengthen your intention to remember?

Start by paying close attention. If you’re distracted, you aren’t as likely to remember. When you learn something new, be sure that you understand it and that you

How do the number and form of your memories affect your ability to retain information?

Why is it crucial to connect what you learn with what you already know?

What is the principle of basic background?

In what way do pictures strengthen your memory?

How do you make artificial connections?

How do you recite?

What is the basic process of reciting?

What is the best method of reciting, and why?

learn it correctly. If you confuse or fail to understand the original information, you aren't going to miraculously correct it in your memory.

Limiting what you try to learn and organizing it in a meaningful way will improve your ability to retain this information. The Silver Dollar System can aid you in memorizing information. Organizing such information into meaningful categories further improves recall.

Linking new, individual memories to a memory network improves recall. Sometimes you make these connections automatically, but consciously establishing connections (either logical or artificial) between new information and a memory network ensures greater remembering.

The principle of basic background says that what you are able to learn and remember is based on what you already know.

By connecting new information to something you've drawn or visualized, you add a new dimension to that memory by getting the visual side of your brain involved.

You make artificial connections by using memory tricks, or mnemonic devices, to link new information with old information.

The most common method of reciting involves repeating information out loud, from memory, and in your own words. There are, however, other ways to recite. All can be effective if you follow the basic process of reciting.

The basic process comprises three steps: (1) read, (2) convert what you've read, and (3) test yourself on what you've learned.

The best way of reciting is by transforming what you've read into questions, reading

them, and then answering them. This is the best method because when you convert a main idea into a question, you force yourself to remember what you've just read. Reciting by writing causes no embarrassment, creates no disturbance, and provides you with the written evidence of whether you've understood what you've read. And because most tests are written, reciting by writing provides excellent practice in taking tests.

How does reciting strengthen your memory?

Reciting holds information in your short-term memory long enough for the material to jell and then move on to long-term memory.

How does distributed practice aid consolidation?

Distributed practice aids consolidation because memory needs time to coalesce what you've learned and the breaks in this practice provide that time.

What are some advantages of distributed practice?

In addition to allowing time for consolidation, distributed practice provides breathers that discourage fatigue and burnout, increases motivation by creating a sense of accomplishment, and wards off boredom by dividing dull or intimidating subjects into more manageable pieces.

Are there times when it's better to study continuously?

Continuous studying, or massed practice, is appropriate for doing prolonged creative work, such as writing a paper or preparing an oral report. In these situations it's usually best to keep working while you have ideas and information in your mind so they have time to interact and jell.

What are memory plateaus?

Memory plateaus are periods when you appear to be making no progress even though you are making an effort. During these lulls, your mind is consolidating what you've learned thus far.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. According to interactive interference theory, the fact that is most likely to be lost is the middle.
oldest newest middle
2. Reactive interference theory generally applies to information that is disliked.
complicated old-fashioned disliked

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|--------------------------------------|--|
| <u>c</u> 1. Pseudo-forgetting | a. Primary cause of reactive interference |
| <u>b</u> 2. Basic courses | b. Suggests that memories may fight each other for space |
| <u>g</u> 3. Memory network | c. Failure to recall what you never really learned |
| <u>e</u> 4. Plateaus | d. Method for selecting key ideas from your notes |
| <u>a</u> 5. Negative attitude | e. No-progress periods that occur during learning |
| <u>h</u> 6. Interactive interference | f. Study sessions divided by regular breaks |
| <u>d</u> 7. Silver Dollar System | g. Both connects and strengthens related memories |
| <u>f</u> 8. Distributed practice | h. Lay the foundation for basic background |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- T 1. In creative work, massed practice is often preferred over distributed practice.
- T 2. In general, it's easier to recall what you've read than it is to remember what you've heard.
- T 3. Rereading does very little to strengthen your memory.
- F 4. Gerald Miller found that mnemonics had no effect on learning.
- F 5. New information is automatically transferred to long-term memory.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Memory acquires an extra dimension when information is
 - a. written on note cards.
 - ☒ b. drawn or visualized.
 - c. reread or recited.
 - d. condensed or reduced.
2. The most valuable facts from your notes are known as
 - ☒ a. Silver Dollar ideas.
 - b. mnemonic devices.
 - c. memory traces.
 - d. none of the above.
3. According to fading theory, old memories are like a(n)
 - a. basketball court.
 - b. filing cabinet.
 - ☒ c. underused path.
 - d. oil slick.
4. In general, mnemonic devices supply
 - a. visual cues.
 - ☒ b. an organizational system.
 - c. consolidation time.
 - d. interference insurance.
5. No single activity is more important to strengthening memory than
 - ☒ a. recitation.
 - b. rereading.
 - c. revising.
 - d. none of the above.

Short answer. Supply a brief answer for each of the following items.

1. What does retrieval theory suggest about memory?
2. What is the nature of G. A. Miller's notion of memory?
3. Explain the three steps used in all types of reciting.
4. Explain why in recitation questions are preferable to keywords.
5. List some of the advantages of distributed practice.

THE WORD HISTORY SYSTEM

anecdote an'-ec-dote' *n.* 1. A short account of an interesting or humorous incident. 2. Secret or hitherto undivulged particulars of history or biography.

Anecdote: *unpublished notes*



Even among the ancient Greeks there were two kinds of stories—those given out publicly and those known only privately. The latter kind was called *anekdotos*, “not published.” The word was formed by combining *a*, *an*, “not,” and *ekdotos*, “given out.” From this source comes French *anecdote* and thence English *anecdote*, which originally retained the Greek significance of “unpublished narratives.” But an “unpublished narrative” especially about interesting things and famous people, has a ready market; so *anecdotes* are eagerly brought out on every occasion, and the word loses its original sense, coming to mean simply “a story,” “an incident.”

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Business has two basic functions: marketing and *innovation*. Marketing and innovation produce results: All the rest are "costs."

—Peter Drucker (1909–), American business philosopher and author

1. *innovation* improvements research new ideas

Customers deserve the very best. It would be helpful if everyone in business could, to *paraphrase* the American Indian expression, walk a mile in their customer's moccasins.

—Norman R. Augustine (1935–), American author and chairman, Martin Marietta Corporation

2. *paraphrase* the . . . quote reword relate
expression

I want this team to win. I'm *obsessed* with winning.

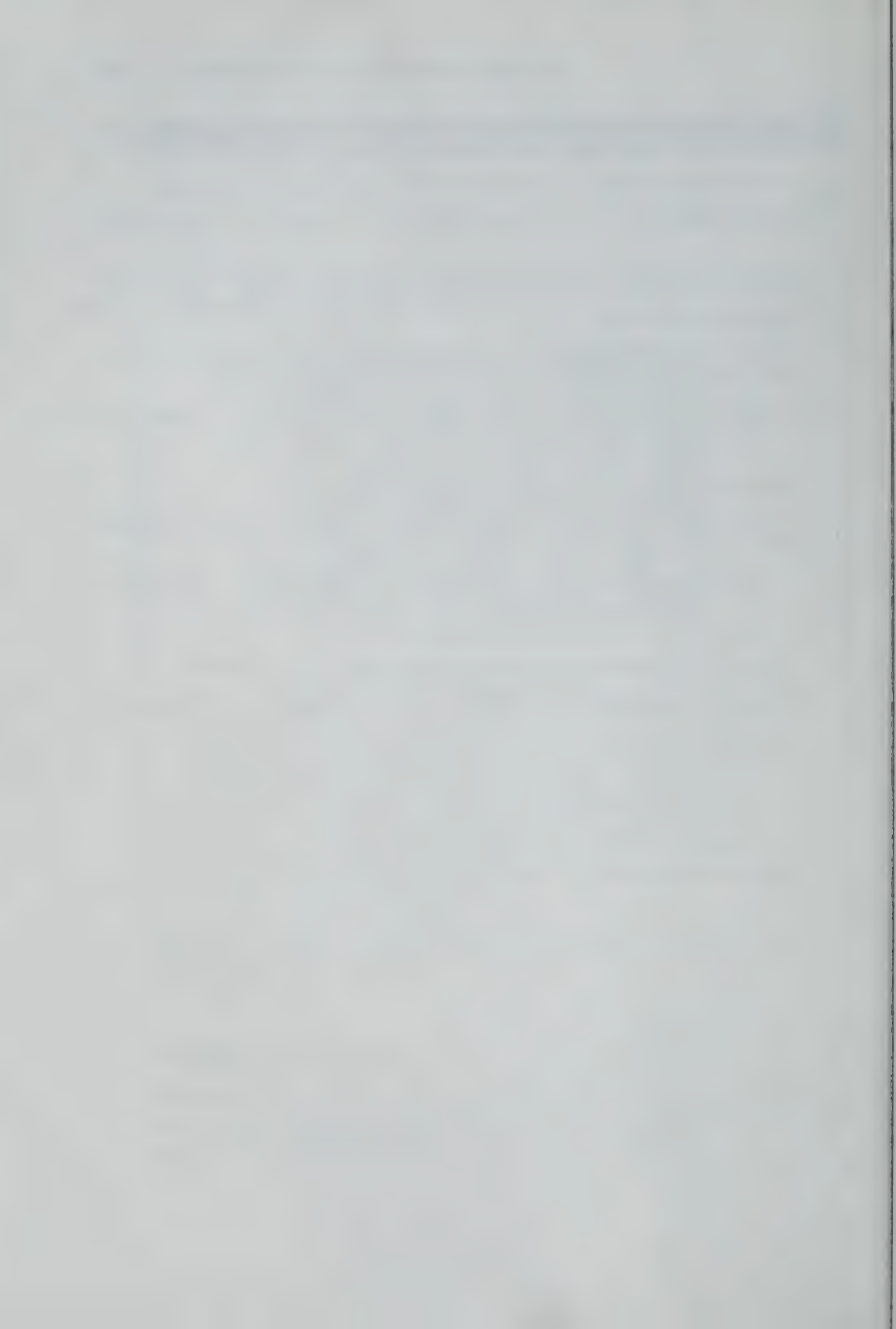
—George Steinbrenner (1930–), American executive owner, New York Yankees baseball team

3. *obsessed* with winning concerned possessed neutral

War is a series of *catastrophes* that results in a victory.

—Georges Clemenceau (1841–1929), French statesman

4. series of *catastrophes* battles tactics disasters



BUILDING A PERMANENT VOCABULARY

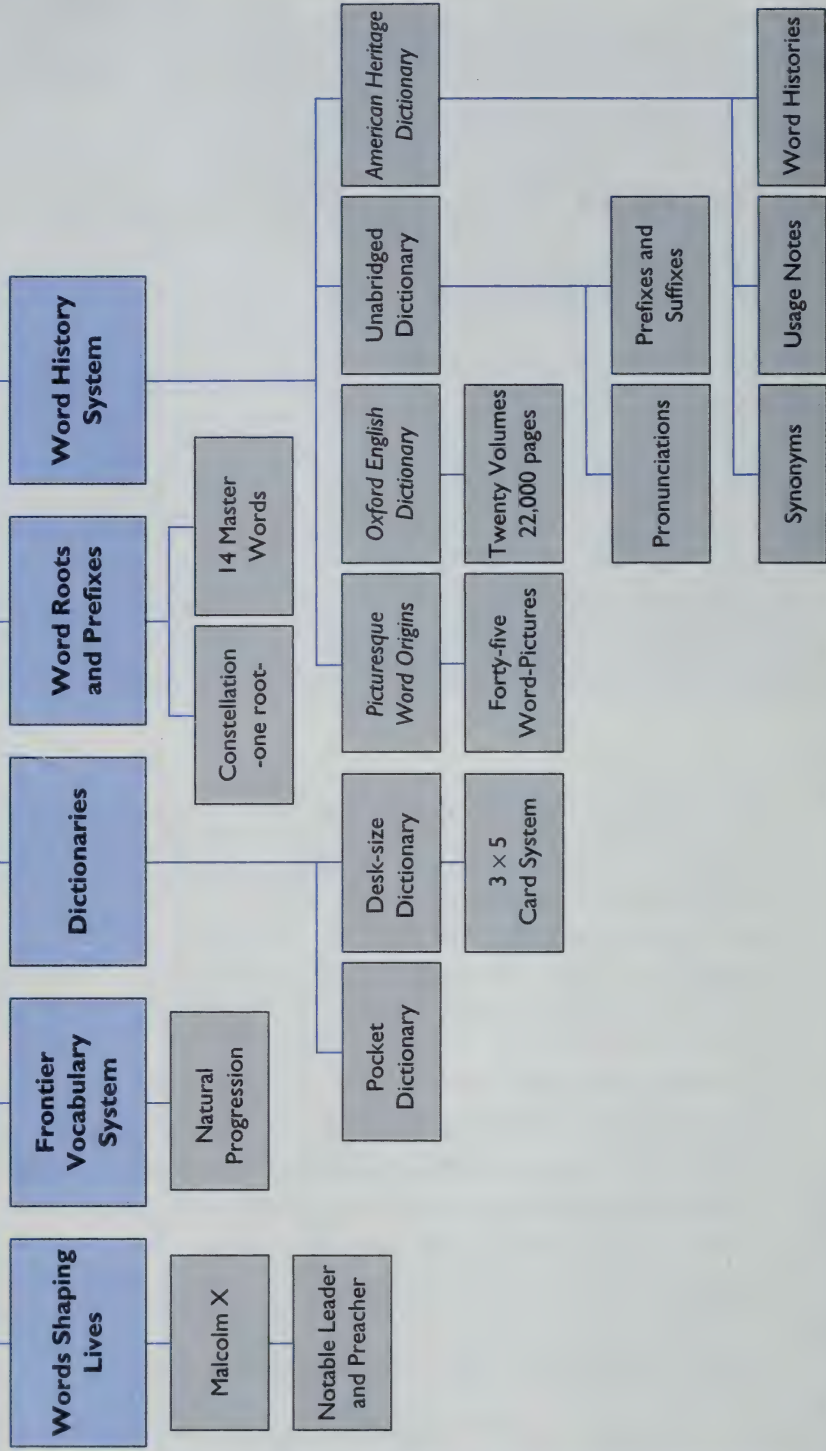
The difference between the right word and the almost right word is the difference between lightning and the lightning bug.

—MARK TWAIN (1835–1910), PEN NAME OF SAMUEL CLEMENS,
AMERICAN NOVELIST

Accumulating a large and precise vocabulary is an adventure. And like most adventures, there'll be the joy of serendipitous discoveries. When you find a word you like, increase the pleasure by finding out all you can about the word's ancestry. When you do, you'll live in an interrelated community of words where you'll always be genuinely at home. This chapter shows many ways to trace the genealogy of words—words that will lead to academic, social, vocational, and professional success. This chapter discusses the value of:

- Reading about how words shaped the life of a notable man
- Understanding and using the Frontier Vocabulary System
- Using word roots, prefixes, and suffixes to understand words
- Benefiting from studying the Fourteen Master Words
- Using newspapers to create interest in words
- Learning word histories through depictions from the book *Picturesque Word Origins*
- Using dictionaries to learn word histories

BUILDING A PERMANENT VOCABULARY



The close relation between vocabulary and academic performance is suggested by a survey, in an eastern engineering college, which showed that the students who improved most in vocabulary during their first college year averaged three or four places nearer the top of their class during the second year, whereas those who did not improve at all in vocabulary averaged 7.5 places nearer the bottom.¹ The Human Engineering Laboratory, which specializes in testing business executives, has found a significant correlation between high vocabulary scores and success at the top executive level. These and similar findings demonstrate that a good vocabulary is not only the mark of an educated man or woman but a valuable asset both in college and after.

THE ROLE OF VOCABULARY

Why the close relationship between vocabulary and success? We'll discuss that later on; but first, let's examine the relationship of the brain and the mind.

The Brain and the Mind

The brain is composed of gray matter and white matter. It is up to us, individually, to develop the two so that the brain becomes our mind. Now, with a mind, we have the capacities for thought, perception, memory, and decision. But how is the mind developed? It's developed mainly through words. Words are the impulses sent over the electrical pathways of the mind, resulting in thinking. It logically follows that the more powerful and precise your vocabulary, the more powerful and precise will be your thinking.

Thinking Is Mainly Silent Speech

When we think, we are actually talking to ourselves silently. When we hear a person all alone uttering words, we usually say, "He's *talking* to himself." The true interpretation of this episode is "He's *thinking* out loud." All thinking is done mainly by using words, either aloud or silently.

¹Cited in *Word Study*, copyright 1958 by G. & C. Merriam Co., Publishers of the Merriam-Webster Dictionaries.

This type of thinking through silent speech goes on whether we are reading, writing, or thinking. Though the following excerpt refers directly to reading, it is just as true of thinking, because both reading and thinking are done mainly with “silent speech.” Robert A. Hall, Jr., an internationally known linguist, states this about inner speech:

It is commonly thought that we can read and write in complete silence, without any speech taking place. True, many people learn to suppress the movement of their organs of speech when they read, so that no sound comes forth; but nevertheless, inside the brain, the impulses for speech are still being sent forth through the nerves, and only the actualization of these impulses is being inhibited on the muscular level, as has been shown by numerous experiments.²

The bottom line: Thinking is done mainly with words—with silent speech.

Relationship Between Vocabulary and Success

Let us examine how the mere learning of words dramatically shaped the life of one notable man: Malcolm X.

Malcolm X While in a penitentiary, Malcolm X was unable to answer letters from his brother and sister because he could not write a sentence, nor spell a word. He felt helpless.

During his spare time, he listened to lectures by Bimbi, a self-educated black man.

What fascinated me with him most of all was that he was the first man I had ever seen command total respect with his words.³

Other men commanded respect because of their strength or cunning, the number of robberies they had committed, and so forth. But Bimbi was different. Malcolm X internalized a strong desire to be like Bimbi—to learn and use words. He reasoned that the best way to learn words was by studying a dictionary. So he borrowed one from the prison school and took it to his cell. He described his first encounter:

In my slow, painstaking, ragged handwriting, I copied into my tablet everything printed on that first page. I believe it took me a day. Then, aloud, I read back to myself, everything I’d written. Over and over, aloud, to myself, I read my own handwriting. I woke up the next morning thinking about those words.⁴

²Robert A. Hall, Jr., *New Ways to Learn a Foreign Language* (New York: Bantam Books, 1966), pp. 28–29.

³Alex Haley and Malcolm X, *The Autobiography of Malcolm X* (New York: Ballantine Books, 1964), p. 428.

⁴Ibid.

Either Malcolm X shaped his life around words, or the words took over and shaped his life. Either way, he was a winner—he became a “thinking man.” He had words with which to think.

Malcolm X went on to become an outstanding preacher and public speaker. He even lectured to law students at Harvard University. With a wide and exact vocabulary, he was able to express his thoughts and ideas forcefully and intelligently. He earned and commanded respect.

A Caddy’s Tale The absolute prerequisite is *interest*. Without interest, you’ll be average. With interest, there is no limit. The question now is, How do you acquire an interest in words? There is no neat formula. Different people acquire interest in different, individual ways. Malcolm X, for example, acquired his interest while in a penitentiary. The motivational force, as we have seen, was Bimbi. I do, however, believe there is a common strain: Within all of us, there is a desire to lift our self-esteem; that is, we want to feel good about ourselves. And a good vocabulary is one good way to achieve this. Maybe the following episode will convey how vocabulary permanently raised the self-esteem of an individual.

During the Depression days of the 1930s, jobs were hard to find. Caddying at the nearby golf course provided many of us high school boys a way to earn something. Among the caddies, one fellow always got bigger tips than the rest of us. Being curious, I finally asked how he did it. As a friend, he told me his secret.

On the golf course, as well as on the street, one common topic of conversation is the weather. It often begins like this: The golfer would say, “Do you think it will rain this morning?” Almost all the caddies would say, “Yep!” or “Nope!” That would be the end of the query. But my friend had a better scenario. He’d say, “I’m optimistic; there’s a bit of blue in the sky. It won’t rain.” If he were to predict rain, he’d say, “I’m pessimistic today. The clouds are gathering. It’ll rain.” The magic, of course, was in the words *optimistic* and *pessimistic*. These are college-type words, and they made the caddy the mental equal of the golfer. Psychologically, the golfer wouldn’t degrade himself in the eyes of the caddy by tipping him the mere minimum. The next day, I tried it. It worked. *Optimistic* and *pessimistic* are still two of my favorite words. The story sounds mercenary, but there’s a more important dimension; that is, using college-type words creates within you a healthy self-concept—yes, self-esteem.

Creating Interest

The creative use of words creates interest in an audience—whatever that potential audience is. From the heights of literature and poetry to everyday life, words matter in getting us to pay attention.

The Newspaper Way If you look for it, you'll find magic in words whether you're reading your local paper or *The Wall Street Journal*. Writers strive mightily not only to report the facts but also to make their writing interesting, especially by using common words in an uncommon way. To illustrate, the following came from a sports page:

Mike Foligno became the 19th head hockey coach of the Bears in Hershey, Pennsylvania.⁵

The writing craft and the novelty—the interest-catcher—are in the large-lettered headline:

NEW COACH'S IMPACT BEARS WATCHING

There is nothing earthshaking in this—only the personal delight that comes when you see and appreciate what the writer is doing. You feel you're in the know. Yogi Berra said it best: "You can observe a lot if you look."

Even *The Wall Street Journal's* writers use mind-catching headlines such as the next one. Here's the commentary first:

Collectively, the continent's five major periphery nations (Ireland, Portugal, Spain, Finland and the Netherlands) make up only 17% of the market capitalization for Europe as a whole.⁶

Now, here's the large-lettered headline:

IN EUROPE, THE ALSO-RANS ARE SPRINTING

Here the writer cleverly used two words that usually are applied to runners on a track team.

Billboards Even billboards can lead you to become more interested in words, especially when you delight in their creativeness and use of psychology. Here's an example.

Traveling south on Interstate 95, about thirty miles before you cross the border into South Carolina, you are bombarded with a series of large billboards featuring a tourist attraction advertised as SOUTH OF THE BORDER. Most call it a "tourist trap," but the sayings on the billboards are alluring. Children, especially, are attracted by the words. The billboards are the Pied Piper. The words are the Piper's tune.

Most parents have their minds set on getting to Myrtle Beach or to Florida, and they see a stop at South of the Border as a waste of time and money. The children, however, generally want to stop; the parents don't.

⁵Lancaster, Pennsylvania, *Intelligencer Journal* (June 4, 1998), p. D1.

⁶*The Wall Street Journal* (January 29, 1999), p. A1.

The creators of billboards know this. They counter by saying, "Keep Yelling, Kids. They'll Stop!"

No, you won't learn any new words from these billboards, but you'll learn to appreciate and love the power of words, which is a lasting quality. Once you get to love words, vocabulary growth is a cinch. Finally, this billboard line is my favorite:

YOU NEVER SAUSAGE A THING!

I believe the writer of this line looks upon it as a masterpiece.

A Final Word

All the preceding illustrations will do fine things for you, if you let them. They'll encourage you to love words, and they'll make you a better writer. I guarantee it.

YOUR BEST TEACHER: THE DICTIONARY

Throughout your college years, new words will be flooding into your consciousness. Many of them are the keys to ideas and information that will be new to you. When students have trouble in a course, the trouble can often be traced back to their imperfect comprehension of terms that are essential to an understanding of subject matter. A first-year science or social science course may introduce you to almost as many new words as a first course in a foreign language—for example:

<i>Chemistry</i>	<i>Geology</i>	<i>Psychology</i>	<i>Sociology</i>
kinetic	syncline	decenter	ethnocentrism
colloid	moraine	synapse	sociometry
adsorption	diastrophic	receptor	superorganic
isomer	Pleistocene	mesomorph	mana

Then there are also words like *base* in chemistry and *accommodation* in psychology, which may not literally be new to you, but which have specific meanings within the context of a specific course and, therefore, must be learned as if they were new words.

For a college student, a large, wide-ranging vocabulary is not just something "nice" to have. It is a necessary medium for grasping fundamental ideas and facts. Words are the instruments of communication, learning, and thinking. Like a mechanic with an inadequate tool kit, a student with an

inadequate vocabulary cannot function effectively and efficiently. Because you cannot go to a hardware store and buy new words to complete your kit of communication tools, as you listen and read you must be on the lookout for words to add to your vocabulary. When you find such words, gather them in immediately. Write them down, in the sentence in which you found them, so you'll have their context. Then, as soon as you can, look them up in a good dictionary.

Using a Dictionary

The best way to learn new words is to keep a good dictionary close to your elbow and use it. Gliding over a word that you don't quite know can be costly. Consider this sentence: "The mayor gave *fulsome* praise to the budget committee." What does *fulsome* mean? If you think it means "full of praise," you're mistaken. Look it up in your dictionary.

Sometimes, you can get some idea of the meaning of a new word from its context—how it is used in your reading material. Use context when you can, but be aware that it has its limitations. Lee C. Deighton of Columbia University points out three: (1) Context provides only the meaning that fits that particular situation. (2) You often end up with a synonym, which is not quite the same as a definition. (3) When you have to infer the meaning of a word, you can be slightly (or greatly) in error.⁷ Your safest bet is to avoid all the guesswork and go straight to your dictionary.

As you study, consult your dictionary whenever you come to a word that you don't know precisely. Find the exact meaning you need; then go back to your textbook and reread the paragraph, with the *meaning* substituted for the word. If you become interested in a particular word, write it on a 3 × 5 card. Later, go back to the dictionary and investigate it. Write its meanings on the card, and keep the card and other like cards to look through and study occasionally. But don't break into your studying for a long session with the dictionary; save that for later.

Many scholars and businesspeople rely on a pocket dictionary as a handy source of definitions. Eddie Rickenbacker (1890–1973), auto racer, ace fighter pilot in World War I, and businessman who left school when he was only twelve years old, made it a habit to carry a small dictionary in his pocket. In his autobiography, he recalled:

Though much of my association was with mechanics and other drivers, I also had the opportunity to converse with men in higher positions, automotive

⁷Lee C. Deighton, *Vocabulary Development in the Classroom* (New York: Teachers College Press, 1959), pp. 2–3.

engineers, and company officials. . . . I listened carefully and marked well the way such men constructed and phrased their thoughts. I carried a dictionary with me always and used it. I have never slackened in the pursuit of learning and self-improvement.⁸

Follow the example of thousands of successful people. Get yourself a pocket dictionary such as *Webster's II New Riverside Pocket Dictionary* and always carry it with you. Instead of reading the print on cereal boxes, or looking at advertising placards on buses and subways, or staring into space, take out your dictionary and *read* it. Its definitions will be terse, consisting mainly of synonyms, but its value lies in its ability to spark a lifelong interest in words as well as increase your vocabulary. Of course, a pocket dictionary is no substitute for a larger, desk-size dictionary, but as a portable learning tool, the pocket dictionary is worth at least its weight in gold.

To illustrate how a dictionary is read, let's study Figure 6.1, which is a page from a pocket dictionary.⁹ You open to page 1 and as your eyes drift down the column of words an internal conversation takes place: You think about what you already know about the word and you think about the other aspects of the word such as the syllable that must be accented, the precise definition of the word, and how it could be used in your writing and speaking.

For your study periods, buy and use the best abridged dictionary that you can afford, but be aware that no word is ever fully defined even by a good abridged dictionary. The dictionary meaning is only an operational meaning that will solve your immediate problem. Words have multiple shades of meaning that add richness to our language. These various shades will become apparent to you as you keep reading, listening, and trying to use words in a variety of contexts.

Good abridged desk dictionaries include the following:

The American Heritage Dictionary (Houghton Mifflin Company)

Webster's New Collegiate Dictionary (G. & C. Merriam Company)

Webster's New World Dictionary of American English (Silver Burdett)

For intensive word study, however, there is no substitute for an unabridged dictionary. Locate the unabridged dictionaries in your library—usually they are in the reference room—and use them to supplement your own abridged desk dictionary. An unabridged dictionary gives more definitions, more about the derivations of words, and more on usage. Good one-volume unabridged dictionaries include *Webster's Third New International Dictionary of*

⁸Edward V. Rickenbacker, *Rickenbacker* (Englewood Cliffs, NJ: Prentice-Hall, 1967), pp. 65–66.

⁹*Webster's II New Riverside Pocket Dictionary* (Boston: Houghton Mifflin Company, 1991), p. 1.

A

The Japanese
used this
device from
ancient times

Strong, simple
word
Somewhat
similar
to abridge

King Edward
VIII Throne of
England

Preferred
accent on
3rd syllable

"Exception"
to the rule

In law: to
"aid & abet"

a, A (ā) *n.* The 1st letter of the English alphabet.

a (ə; *emphatic* ā) *indef. art.* One; any.
a*back (ə-bāk') *adv.* —**take** **aback**.

To startle; confuse.
abacus (āb'ə-kəs) *n., pl. -cuses* or
-ci. A manual computing device
with rows of moveable beads.

abandon (əbān'dən) *v.* **1.** To give
up; forsake. **2.** To desert. —*n.* A
complete surrender of inhibitions.

—**a*ban'doned** *adj.* —**a*ban'don***
ment *n.*

abase (ə-bās') *v.* **abased**, **abasing**.
To humble; humiliate.
—**a*base'ment** *n.*

abate (ə-bāt') *v.* **abated**, **abating**. To
reduce; lessen. —**a*bate'ment** *n.*

abbey (āb'ē) *n., pl. -beys*. A monas-
tery or convent.

abreviate (ə-brē've-āt') *v.* -**ated**,
-**ating**. To make shorter.
—**ab*bre'via'tion** *n.*

abdicate (āb'dī-kāt') *v.* -**cated**,
-**cating**. To relinquish (power or
responsibility) formally.
—**ab'dica'tion** *n.*

abdomen (āb'də-mən, āb-dō'mən) *n.*
The part of the body between the
thorax and the pelvis. —**ab***
dom'i*nal *adj.*

abduct (āb-dūkt') *v.* To kidnap. —**ab***
duc'tion *n.* —**ab*duc'tor** *n.*

aberration (āb'ə-rā'shən) *n.*
Deviation or departure from the
normal, typical, or expected.

—**ab'er'rance**, —**ab'er'ran*cy**
n. —**ab'er'rant** *adj.*

abet (ə-bēt') *v.* **abetted**, **abetting**.
1. To encourage; incite. **2.** To assist.
—**a*bet'tor**, **a*bet'ter** *n.*

abeyance (ə-bū'əns) *n.* Temporary
suspension.

abhor (āb-hōr') *v.* -**horred**, -**horring**.
To dislike intensely; loathe.
—**ab*hor'rence** *n.* —**ab***
hor'rent *adj.*

abide (ə-bīd') *v.* **abode** or **abided**,
abiding. **1.** To wait. **2.** To tolerate;
bear. **3.** To remain; last. —**abide**
by. To conform to; comply with.
—**a*bid'e'ing** *adj.*

ability (ə-bīl'i-tē) *n., pl. -ties*. **1.** The
power to perform. **2.** A skill or talent.

abject (āb'jēkt', āb-jēkt') *adj.*

1. Contemptible; base. **2.** Miserable;
wretched. —**ab'jec'tion** *n.*
—**ab'ject'ly** *adv.*

abjure (āb-joor') *v.* -**jured**, -**juring**.

To renounce under oath; forswear.

able (ā-bəl') *adj.* **abler**, **ablest**.

1. Having sufficient ability. **2.**
Capable or talented. —**a*bly** *adv.*

abnegate (āb-nī-gāt') *v.* -**gated**,
-**gating**. To deny to oneself;
renounce. —**ab'ne*ga'tion** *n.*

abnormal (āb-nōr'məl) *adj.* Not
normal; deviant. —**ab'nor'mal'i-**
ty *adv.*

abode (ə-bōd') *v.* *p.t. & p.p. of abide*.
—*n.* A home.

abolish (ə-bōl'ish) *v.* To put an end
to; annul. —**ab'o*li'tion** *n.*

—**ab'o*li'tion*ist**. *n.*

abominable (ə-bōm'ə-nə-bəl) *adj.*
Detestable; loathsome. —**a*bom'i***
nably *adv.* —**a*bom'i*nate** *v.*
—**a*bom'i*na'tion** *n.*

aborigine (āb'ə-rīj'ə-nē) *n.* An
original inhabitant of a region.

—**ab'o*rig'i*nal** *adj. & n.*

abort (ə-bōrt') *v.* To terminate
pregnancy or full development
prematurely. —*n.* Premature
termination of a rocket launch or
space mission. —**a*bor'tive** *adj.*

abortion (ə-bōr'shən) *n.* **1.** Induced
premature termination of pregnancy
or development. **2.** Something
malformed. —**a*bor'tion*ist** *n.*

abound (ə-bound') *v.* To be great in
number or amount; teem.

about (ə-bout') *adv.* **1.** Approximately.

2. Toward a reverse direction. **3.** In the vicinity. —*prep.* **1.** On all sides
of. **2.** Near to. **3.** In or on. **4.** Con-
cerning. **5.** Ready. —*adj.* **Astir**.

above (ə-būv') *adv.* **1.** Overhead. **2.** In
a higher place, rank, or position.
—*prep.* **1.** Over. **2.** Superior to. **3.** In
preference to. —*n.* Something that is
above. —*adj.* Appearing or stated
earlier.

aboveboard (ə-būv'bōrd', -bōrd') *adv.*
Without deceit. —**a*bove'board**
adj.

abrasion (ə-brā'zhən) *n.* **1.** A wear-
ing away by friction. **2.** A scraped
or worn area. —**a*brade'** *v.* —**a***
bra'sive *adj. & n.*

abridge (ə-brīj') *v.* **abridged**, **abridg-**
ing. To condense; shorten. —**a***
bridg'ment, **a*bridge'ment** *n.*

abroad (ə-brōd') *adv.* **1.** Out of one's
own country. **2.** Out of doors. **3.**
Broadly; widely.

Looks like
object but
far off

In unabridged
dictionary:
"He abjured
all titles, pre-
ferring 'Mr.'"

Personal rights.
Abdicate —
national power

Usually
connected to
Snowmen of
the Himalayas

Usually applied
to original
people of
Australia

"The mosqui-
toes abound
in swamps"

Rubbing,
scraping as
in friction

Big dictionary
— unabridged

FIGURE 6.1 Random and Spontaneous Thoughts About Words

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the English Language, and the *Random House Dictionary of the English Language*. *The Oxford English Dictionary*, in twenty volumes plus supplements, is indispensable for the historical study of words but is more detailed than you will need for most purposes.

The reference librarian can help you find specialized dictionaries on a variety of subjects. They list technical terms that are not always found even in unabridged dictionaries. However, your textbooks are usually the best sources of the definitions for such terms.

The Desk-Size Dictionary

The dictionary that I keep at my elbow is *The American Heritage Dictionary*, Third Edition, published by Houghton Mifflin Company. Why did I choose this dictionary? For many reasons: First, because the typeset is excellent. The entry words are large and in dark print. The definitions are complete and the space between lines is generous, making the words easy to read. Second, it has many of an unabridged dictionary's characteristics, such as word histories, usage notes, regional notes, and synonyms.

Third and best of all, for illustrative purposes and interest's sake, the outer margin of each page includes actual pictures of persons, animals, and objects, explanatory drawings, and other illustrative features, thus adding visual dimensions to words defined and explained on the same page (see Figure 6.2).

In other words, this dictionary combines the best features of a standard dictionary, an unabridged dictionary, and an encyclopedia; yet it is an easily handled desk-size book.

Incidentally, one added serendipitous pleasure is that almost every time I flip the pages of this dictionary, I find an unexpected joy at seeing a picture of Count Basie or Mary McLeod Bethune or Ludwig van Beethoven and thinking, "Oh, this is how they looked!" Incidentally, knowing that there are these interesting pictures, I'm drawn, psychologically, to use the dictionary even for words I already know—but under the pretense that I want to know them more precisely.

A good desk dictionary is also a handy instrument for helping you to build your vocabulary via the 3 × 5 card system, which is discussed next.

The 3 × 5 Card System

There is no quick and easy way to a powerful vocabulary. Don't fall for any advertising that claims otherwise. The only sure way to master words is to

ba-bu also **ba-boo** (bā-'bō) *n.* 1. Used as a Hindi courtesy title for a man, equivalent to *Mr.* 2. *a.* A Hindu clerk who is literate in English. *b.* *Offensive.* A native of India who has acquired some superficial education in English. [Hindi bābā, father.]

ba-bul (bā-'bōl) *n.* A tropical African tree (*Acacia nilotica*) that yields a gum similar to gum arabic and has a bark used in tanning. [Persian bābul.]

ba-bur (bā-'bur) *See* **Baber**.

ba-bush-ka (bā-'bōsh-'ka) *n.* A woman's head scarf, folded triangularly and worn tied under the chin. [Russian, grandmother, diminutive of *baba*, old woman.]

ba-bu-yan islands (bā-'bō-'yan) An island group of the Philippines separated from the northern coast of Luzon by the narrow **Babuyan Channel**. The group comprises 24 islands, including **Babuyan Island** in the northeast.

ba-by (bā-'bē) *n.* *pl.* **-bies**. 1. *a.* A very young child; an infant. *b.* The youngest member of a family or group. *c.* A very young animal. 2. An adult or a young person who behaves in an infantile way. 3. *Slang.* A girl or young woman. 4. *Slang.* An object of personal concern or interest. *Keeping the boot in good repair is your baby.* — **ba-by** *adj.* *-ier, -iest*. 1. Of or having to do with a baby. 2. Infantile or childish. 3. Small in comparison with others of the same kind: *baby vegetables*. — *tr.* **-bled, -bly, -bles**. To treat with often inordinate indulgence and solicitude. *See* Synonyms at **pamper**. [Middle English] — **ba-by-hood** *n.* — **ba-by-ish** *adj.*

baby blue *n.* *Color.* A very light to pale greenish or purplish blue.

ba-by-blue-eyes (bā-'bē-'blū-'ēz) *pl.* *used with a sing. or pl. verb.* An annual plant (*Nemophila menziesii*), native to California and having showy flowers that typically are bright blue with white centers.

baby bond *n.* A bond issued in an amount less than \$1,000.

baby boom *n.* A sudden, large increase in the birthrate, especially the one in the United States after World War II from 1947 through 1961. — **ba-by-boom'** (bā-'bē-'bōm') *adj.*

ba-by-boom-er also **ba-by-boom-er** (bā-'bē-'bō-'mər) *n.* A member of a baby-boom generation.

baby bust *n.* A sudden decline in the birthrate.

baby carriage *n.* A four-wheeled carriage, often with a hood that folds back and having a handle for pushing, used for wheeling an infant about.

baby grand *n.* *Music.* A small grand piano about 1.5 meters (5 feet) long.

Bab-y-lon¹ (bā-'bē-'lōn, '-lōn') The capital of ancient Babylonia in Mesopotamia on the Euphrates River. Established as capital c. 1750 B.C. and rebuilt in regal splendor by Nebuchadnezzar II after its destruction (c. 589 B.C.) by the Assyrians, Babylon was the site of the Hanging Gardens, one of the Seven Wonders of the World.

Bab-y-lon² (bā-'bē-'lōn, '-lōn') *n.* 1. A city or place of great luxury, sensuality, and often vice and corruption. 2. A place of captivity or exile.

Bab-y-lo-ni-a (bā-'bē-'lōn-'ē-ā) An ancient empire of Mesopotamia in the Euphrates River valley. It flourished under Hammurabi and Nebuchadnezzar II but declined after 562 B.C. and fell to the Persians in 539.

Bab-y-lo-ni-an (bā-'bē-'lōn-'ē-ān) *adj.* *Abbr.* **Bab.** 1. Of or relating to Babylon or Babylon or its people, culture, or language. 2. Characterized by a luxurious, pleasure-seeking, and often immoral way of life. — **Babylonian** *n.* *Abbr.* **Bab.** 1. A native or inhabitant of Babylon or Babylonia. 2. The form of Akkadian used in Babylonia.

ba-by's-breath (bā-'bē) *n.* Any of several Eurasian plants of the genus *Cynophila*, such as *G. paniculata*, having numerous small, white flowers in profusely branched panicles. It is especially popular in flower arrangements and bouquets.

ba-by-sit (bā-'bē-'sīt) *v.* *-sitting, -sits*. — *intr.* To take care of someone or something needing attention or guidance. — *tr.* To take care of: *ba-by-sat the children; ba-by-sat the Soviet defector; ba-by-sit a breaking news story.*

WORD HISTORY: The verb *ba-by-sit* is of interest to parents, children, and linguists. It is interesting to the last group because it illustrates one of two types of the linguistic process called back-formation. The first type is based on misunderstanding, as in the case of our word *pes*. In Middle English the ancestor of *pes* had plural forms, such as *pese* and *pease*, that were identical with singular forms. In other words, the *s* was part of the word, not a plural ending. But around the beginning of the 17th century people began to interpret the sound represented by *s* as a plural ending, and a new singular, spelled *pee* in Modern English, was developed. On the other hand, in the case of *ba-by-sit*, first recorded in 1847, and *ba-by-sitter*, first recorded in 1937, no misunderstanding is involved. The agent noun *ba-by-sitter* with its *-er* suffix could have been derived from the verb *ba-by-sit*, as *diver* was from *div*, but the evidence seems to show that the pattern was reversed, and the agent noun preceded the verb from which it would normally have been derived.

ba-by-sitter *n.* 1. A person engaged to care for one or more children when the parents or guardians are not at home. 2. A

person who cares for or watches someone or something that needs constant attention and guidance.

ba-by's-tears also **ba-by-tears** (bā-'bē-'tēz) *pl.* *n.* (used with a sing. or pl. verb). An evergreen, mat-forming perennial (*Soleriella soleriolis*) native to Corsica and Sardinia, grown as an ornamental for its numerous tiny, roundish leaves.

ba-by-tooth *n.* *See* **milk tooth**.

BAC *abbr.* Blood alcohol concentration.

ba-cău (bā-'kəu') A city of eastern Romania north-northeast of Bucharest. It is an industrial center in an oil-producing region. Population, 165,655.

ba-ca-lau-re-ate (bā-'kə-'lōr-'ē-ā) *n.* 1. *See* **bachelor's degree**. 2. A farewell address in the form of a sermon delivered to a graduating class. [Medieval Latin *baccalaureatus* (influenced by *bacca*, berry + *laureatus*, crowned with laurel), from *baccarius*, bachelor. *See* **BACHELOR**.]

ba-ca-rot (bā-'kə-'rōt, bā-'kə-'rō) *n.* Games. A card game in which the winner is the player who holds two or three cards totaling closest to nine. [French *baccarat*, from Provençal.]

ba-cate (bā-'kāt) *adj.* 1. Resembling a berry in texture or form: *berrylike*. 2. Bearing berries. [From Latin *bacca*, berry.]

Bac-chae (bā-'kē) *pl.* *n.* *Greek & Roman Mythology.* The priestesses and female followers of Bacchus. [Latin, from Greek *Bakkhai*, pl. of *Bakkhē*, female worshiper of Bacchus, from *Bakchos*, Bacchus.]

ba-ch-a-nal (bā-'kən-'nāl, '-nāl) (bā-'kən-'nāl) *n.* 1. A participant in the Bacchanalia. 2. *Often* **bacchanale**. The Bacchanalia. 3. A drunken or riotous celebration. 4. A reveler. — **bacchanal** *adj.* Of, relating to, or typical of the worship of Bacchus. [Latin *bacchanalis*, of Bacchus, probably from *Bacchānalia*, Bacchanalia, from *Bacchus*, Bacchus, from Greek *Bakkhos*.]

Bac-cha-nal-ia (bā-'kən-'nāl-'yā, '-nāl-'ē-ā) *n.* *pl.* **Bacchanalia**. 1. The ancient Roman festival in honor of Bacchus. 2. *Often* **bacchanalia**. A riotous, boisterous, or drunken festivity: a revel. [Latin, from *Bacchus*, Bacchus, from Greek *Bakkhos*.] — **Bac-cha-nal-ian** *adj.* *n.*

ba-ch-ant (bā-'kənt-, 'kənt', bā-'kənt) *n.* *pl.* **ba-ch-ants** or **ba-ch-ant-tes** (bā-'kən-'tēz, '-kən-'tēz, '-kən-'tēz) 1. *Greek & Roman Mythology.* A priest or votary of Bacchus. 2. A boisterous reveler. [Latin *Bacchant*, *bacchant*, present participle of *bacchari*, to celebrate the festival of Bacchus, from *Bacchus*, Bacchus, from Greek *Bakkhos*.] — **ba-ch-ant-ly** (bā-'kən-'tēl) *adj.*

ba-ch-ant-ly (bā-'kən-'tēl, 'kən-'tēl, '-kən-'tēl) *n.* *Greek & Roman Mythology.* A priestess or female votary of Bacchus. [French, from Latin *Bacchānā, bacchant*. *See* **BACCHANT**.]

ba-ch-ant-tes (bā-'kən-'tēz, '-kən-'tēz, '-kən-'tēz) *n.* A plural of **bacchant**.

Bac-chic (bā-'kēk) *adj.* 1. *Greek & Roman Mythology.* Of or relating to Bacchus. 2. *ba-chic*. Drunken and carousing. — **Bac-chus** (bā-'kəs) *n.* *Greek & Roman Mythology.* *See* **Dionysus**.

bach also **bäcch** (bäch) *intr.* *v.* **bached, bäch-ing, bäch-es** also **bäched, bäch-ing, bäch-es**. *Informal.* To live alone and keep house as a bachelor. [Short for **BACHELOR**.] — **bach** *n.*

Bach (häx, häk), **Johann Sebastian**, 1685–1750. German composer and organist of the late baroque period. Among the greatest composers in history, he wrote more than 200 cantatas, the *Saint Matthew Passion* (1729), the Mass in B minor (1733–1736), orchestral works such as the six *Brandenburg Concertos*, and numerous works for organ, harpsichord, other solo instruments, and chamber ensembles. Four of his children became noted musicians: *Wilhelm Friedemann Bach* (1710–1744); *Carl Philipp Emanuel Bach* (1714–1788), important figure in the development of the symphony; *Johann Christoph Friedrich Bach* (1732–1795); and *Johann Christian Bach* (1733–1782).

bach-a-lor (bäch-'lär, bäch-'lär) *n.* *Abbr.* **B.** 1. An unmarried man. 2. A person who has completed the undergraduate curriculum of a college or university and holds a bachelor's degree. 3. A male animal that does not mate during the breeding season, especially a young male fur seal kept from the breeding territory by older males. 4. A young knight in the service of another knight in feudal times. [Middle English *bachelier*, squire, youth, bachelor, from Old French, from Medieval Latin *baccalarius*, tenant farmer, perhaps of Celtic origin.] — **bach-e-lor-dom**, **bach-e-lor-hood**, **bach-e-lor-ship** *n.*

bach-e-lor's (bäch-'lör, bäch-'lär) *n.* A bachelor's degree. **bachelor's button** *n.* *pl.* **bachelor's buttons**. 1. *See* **cornflower**. 2. Any of several plants that have buttonlike flowers or flower heads.

bachelor's degree *n.* An academic degree conferred by a college or university upon those who complete the undergraduate curriculum. Also called *baccalaureate*.

ba-cil-lar-y (bäs-'lär-'ē, bäs-'lär-'ē) also **ba-cil-lar** (bäs-'lär, bäs-'lär) *adj.* 1. Shaped like a rod or rods. 2. *a.* Consisting of small rods or rodlike structures. *b.* Caused by, relating to, or resembling bacilli: *bacillary dysentery*. [From **BACILLUS**.]

ba-cil-lus (bäs-'lās) *n.* *pl.* **-illi** (-'sīl-'ī). *Abbr.* **B.** 1. Any of various rod-shaped, spore-forming, aerobic bacteria of the genus *Bacillus* that often occur in chains and include *Bacillus anthracis*, the causative agent of anthrax. 2. Any of various bacteria, especially a rod-shaped bacterium. [Late Latin, diminutive of Latin *baculum*, rod. *See* **bak-** in Appendix.]

Ba-cil-lus Cal-mette-Gué-rin vac-cine (bäs-'lās käl-



Clara Barton



Chief Joseph

a pat	oi boy
a pay	ou out
är care	öo took
a father	öo boot
é pet	öü cut
é be	ör urge
i pit	th thin
i pie	th this
i pier	wh which
ö pet	zh vision
ö toe	a about, item
ö ü	ö regionalism

—ress marks: * (primary); * (secondary), as in dictionary (dīk-'shə-nē-ē)

FIGURE 6.2 A Page from The American Heritage Dictionary

Note: The pictures, however, were taken from several different pages for illustration.

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not only learn them, but *overlearn* them by using the undisputedly best memory-enhancing technique of *recitation*. To get started, all you need is a dictionary and a stack of 3×5 cards (see Figure 6.3). On the cards, write the difficult words that you find in your textbooks and hear in the classroom. These are words you need to know to understand your coursework. Here are the steps to make the 3×5 system work for you.

1. When you select a word, write it on the front of a 3×5 card. To provide a meaningful context, write the complete sentence in which the word occurs and underline the word so that it stands out.
2. Look the word up in a dictionary and, on the front of the card, write the word out in syllables, including accent and diacritical marks so that you can pronounce it correctly. If you can't pronounce it and spell it correctly, you won't use it later.
3. On the back of the card, write the prefix and root that make up your word. The prefix and root will help you remember the word by showing you its logical linguistic structure.
4. Still on the back of the card, write the several pertinent definitions of the word. You might as well extract the maximum in meanings while you're at it! Then, put an asterisk beside the definition that best fits the meaning of your word in its specific context.
5. For a technical term, write the definition given in your textbook. Special terms are usually defined when first introduced or in a glossary. Even for a special term, on the reverse side record any information you find about its derivation. Often, you'll have to consult an unabridged dictionary.

In the above five steps we've covered how to construct your cards for the 3×5 system. Now, we'll present the steps for using the cards efficiently and effectively. You've put in a lot of work. Get the maximum learning from it.

To master the words on the cards, do the following:

1. Always look first at the front of the card. First, pronounce the word aloud and correctly. Then read the sentence aloud and think about it momentarily. Next, define the word—not necessarily in a dictionary's language, but meaningfully in your own words. Read the sentence aloud. All this should be done before you look at the definition on the back. Reading and speaking aloud forces you to think alertly, and hearing the words brings into play your auditory memory. Thus, seeing, saying, hearing, and thinking are all working for you.
2. After you have defined the word to the best of your ability, turn the card over to check the accuracy of your definition.

(FRONT)

"And I stand ready to oppose to the uttermost any group that seeks to limit or pervert the curricula of schools and colleges in order to impose upon them their own narrow and dogmatic preconceptions concerning matters that are properly the subject of free inquiry."

pre'con-cep'tion
prē'kan-sĕp'shan

(REVERSE)

pre = before; denoting before in time.
con = with, together, in conjunction.
cept = from capere, to take

1. An opinion formed in advance of full knowledge.
2. Prejudice or bias.

FIGURE 6.3 3 × 5 Card System

Notice that the front of the card shows the new word underlined in a complete sentence. It also shows how to pronounce the word. The reverse of each card defines prefixes and roots and gives important dictionary definitions of the word. An asterisk is placed beside the definition that most nearly matches the use of the word on the front of the card.

3. If you are not satisfied with your definition, keep reciting and re-reciting until your definition is correct. For memory's sake, you must, in order to extract it later, enter into your mind a correct, crisp, concise meaning for the word in the first place. This is pure logic.
4. When you fail to define the word correctly on your first try, place a dot on the front of the card, in the upper-right-hand corner. The next time you go through your cards, the dot will remind you that you missed the word on a previous try. When a card has three dots, it is time to give that word some extra attention by determining why you continually get it wrong.
5. After a small stack of cards has been mastered, place them in a shoebox and put together another small stack for studying.
6. From time to time, review the words that you have mastered. Reviewing mastered words will take much less time than learning unmastered ones. Remember, the tendency to forget is working day and night with its erosive power. To foil this relentless force, a quick periodic review will outmaneuver it.

The advantage of 3 × 5 cards is that they are convenient to carry around for study at odd moments. At all times, have with you a few blank cards on which to record interesting words. Learning words that intrigue you will be immeasurably more valuable than memorizing a list made up for you by

someone else. Finally, as you master the precise meaning of each word, there will be a corresponding advance in your reading, writing, speaking, and thinking.

Incidentally, the 3×5 card system is an enduring system—it is a lifetime system. While teaching my course to business executives, I encountered over and over again executives, including presidents, who would whip out of their shirt pockets a small stack of 3×5 vocabulary cards. One president said that he had learned this system from his English professor at Yale, years before. The professor had told his class about a study showing that almost immediately after graduation, vocabularies of professional people steadily decrease as they begin to rely heavily on professional jargon.

USING THE FRONTIER VOCABULARY SYSTEM

Consulting the dictionary or probing the histories of words can help to increase your vocabulary word by word. One highly effective way to increase your vocabulary is to use the Frontier Vocabulary System developed by Johnson O'Connor. The Frontier Vocabulary System is based on natural learning processes.¹⁰ We know that a baby must crawl before it can walk and walk before it can run. We know, too, that a child can pronounce the sound *p* at about age $3\frac{1}{2}$ but usually does not master the sound *r* until about age $7\frac{1}{2}$. Many other skills develop along with physical growth and general maturation. All learning processes have four characteristics:

1. Skills progress from the simple to the complex.
2. Each skill is developed in an orderly sequence of steps.
3. Each step is at a different level of difficulty.
4. No significant step may be skipped. Each step seems to develop the muscle or brain pattern that makes the next step possible.

From his analytical research, O'Connor concluded that learning new words is much like learning any other skill. We progress from simple words to more difficult ones in an orderly sequence. The difficulty or ease of learning a word does not depend on the length of the word, its frequency of use, its geographic origin, or its pronunciation—or on teachers, books, or parents. Instead, difficulty in learning a word depends on the complexity of the *idea* that the word stands for. Defining words with simple synonyms does not provide the learner with a background sufficient to think with the words. Because words stand for ideas, the ideas behind them must also be learned.

¹⁰Much of this discussion is based on an article by Dean Trembly, "Intellectual Abilities as Motivating Factors," *Japanese Psychological Research* 10, no. 2 (July 1968): 104-108.

S.I. Hayakawa, the noted semanticist, agrees with this view. He questions the old-fashioned notion that the way to study words is to concentrate one's attention exclusively on words. Hayakawa suggests that words should be understood in relationship to other words—not only other words on the same level but also words at a higher (more abstract) level and words at a lower (more concrete) level.

Principles Governing the Learning of Words

The following findings by O'Connor form the basis for the Frontier Vocabulary System:

1. The easiest words are learned first; then the harder ones are learned.
2. At the forward edge of the mass of all the words that have been mastered is the individual's *frontier*. Only a very few words *beyond the frontier* have already been mastered.
3. The greatest learning takes place in the frontier area, which lies between the zone of known words and the zone of totally unknown words (see Figure 6.4).
4. The most significant characteristic of the words in the frontier area is that they are, to some extent, familiar. The maximum advancement in a person's mastery of words takes place in the frontier area, where hundreds of almost-known words need only a slight straightening out to make them familiar.
5. Learning becomes extremely inefficient and may actually break down whenever a person skips the frontier area and tries to learn totally unknown words.

Familiarity with a word in the frontier area means that you already know something about the word or its definition. You may, for example, know how to pronounce the word and know its general meaning. Or you may know one of its several meanings. The important point is this: By singling out such a frontier word and learning its specific meaning, or its several definitions, you can master the word with minimal time and effort.

By working continually in the frontier area, you can make rapid progress in mastering words. At the same time, you will continually be discovering new frontier words to conquer. As the process continues, the frontier area will push into the zone of totally unknown words.

Recognizing Frontier Words

To find your own frontier words, first become aware of your daily speech, and make a list of the unusual words you use. Next, be on the lookout for

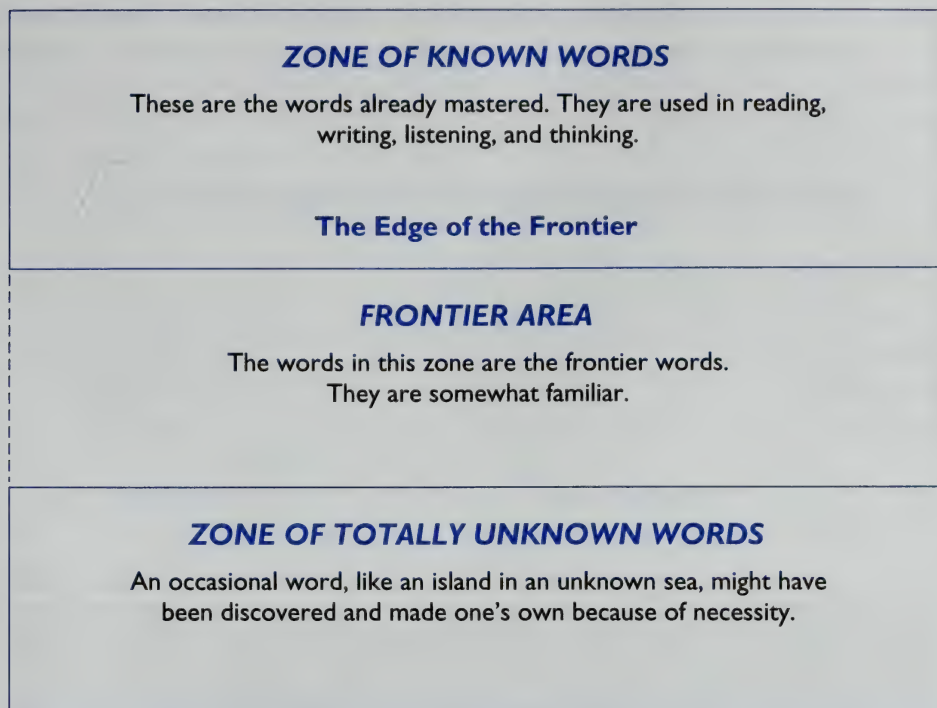


FIGURE 6.4 The Concept of Frontier Words

words that you recognize in reading but do not use in speaking and writing. From this source choose *only* the words that appeal to you. Listen attentively while other people speak. The chances are great that you will recognize and know the general meaning of all the words you hear. Choose from this stream of speech the words that appeal to you—words that you would like to incorporate into your own speech.

Later, after writing out the definition for each of your frontier words, look for its antonym (opposite). If it interests you, learn that word, too. Learning pairs of contrasting words creates the strong force of spontaneous suggestion—either word suggests the other.

Making the Frontier System Work

After you have selected the words that appeal to you, you must have a system for memorizing them. There is no better system than the one already explained in detail: It's the 3×5 card system. Use it and you'll be successful. Figure 6.5 shows the Frontier Vocabulary System format.

As you master the precise meaning of each frontier word, there will be a corresponding advance in your reading, writing, speaking, and thinking.

RECOGNIZING WORD ROOTS AND PREFIXES

Using the dictionary is an excellent way to increase your vocabulary one word at a time. However, if you would like to learn whole clusters of words in one stroke, you should get to know the most common roots and prefixes in English. A word *root* is the core of a word, the part that holds the basic

(FRONT) (a)

His silence implied that he, at least, did not disagree with my statement.

im-ply' (ĩm-plĩ')
im-plied' (ĩm-plĩd')

(REVERSE) (a)

[im = in] [plicare = fold]
[implicare = to fold in; to entwine]

- *1. To express indirectly; to suggest; to hint or hint at.
- 2. To contain potentially.

syn.: suggest

(FRONT) (b)

From his silence and manner, I inferred that he agreed with my statement.

in-fer' (ĩn-fũr')
in-ferred' (ĩn-fũrd')
in-fer'ring (ĩn-fũr'ring)

(REVERSE) (b)

[in = in] [ferre = to bring (out)]

- *1. To derive by reasoning; to conclude from facts or premises.
- 2. To surmise; to guess.

syn.: deduce, conclude

FIGURE 6.5 Frontier Vocabulary System Cards These two cards (*implied* and *inferred*) show a pair of words that are opposite or complementary. Such words, studied together, are bound to take on more precise meaning. Notice that the front of each card shows the new word underlined in a complete sentence. It also shows how to pronounce the word. The reverse of each card defines prefixes and roots and gives important dictionary definitions of the word. An asterisk is placed beside the definition that most nearly matches the use of the word on the front of the card. Synonyms are also given.

meaning. A *prefix* is a word beginning that modifies the root. Table 6.1 lists some common word roots, and Table 6.2 lists some common prefixes.

It has been estimated that 60 percent of the English words in common use are made up partly or entirely of prefixes or roots derived from Latin and Greek. The value of learning prefixes and roots is that they illustrate the way much of our language is constructed. Once learned, they can help you recognize and understand many words without resorting to a dictionary. With one well-understood root word as the center, an entire "constellation" of words can be built up. Figure 6.6 shows such a constellation, based on the root "duct," from the Latin *ducere* ("to lead"). Notice that it makes use of some of the most common prefixes and of other prefixes and combining words as well as various word endings. This does not exhaust all the possibilities, either; you should be able to think of several other words growing out of "duct."

TABLE 6.1 Common Word Roots

Root	Meaning	Example	Definition
agri	field	agronomy	Field-crop production and soil management
anthropo	man	anthropology	The study of <i>humans</i>
astro	star	astronaut	One who travels in interplanetary space (<i>stars</i>)
bio	life	biology	The study of <i>life</i>
cardio	heart	cardiac	Pertaining to the <i>heart</i>
chromo	color	chromatology	The science of <i>colors</i>
demos	people	democracy	Government by the <i>people</i>
derma	skin	epidermis	The outer layer of <i>skin</i>
dyna	power	dynamic	Characterized by <i>power</i> and energy
geo	earth	geology	The study of the <i>earth</i>
helio	sun	heliotrope	Any plant that turns toward the <i>sun</i>
hydro	water	hydroponics	Growing of plants in <i>water</i> reinforced with nutrients
hypno	sleep	hypnosis	A state of <i>sleep</i> induced by suggestion
magni	great, big	magnify	To enlarge, to make <i>bigger</i>
man(u)	hand	manuscript	Written by <i>hand</i>
mono	one	monoplane	Airplane with <i>one</i> wing
ortho	straight	orthodox	Right, true, <i>straight</i> opinion
pod	foot	pseudopod	False <i>foot</i>
psycho	mind	psychology	Study of the <i>mind</i> in any of its aspects
pyro	fire	pyrometer	An instrument for measuring temperatures
terra	earth	terrace	A raised platform of <i>earth</i>
thermo	heat	thermometer	Instrument for measuring <i>heat</i>
zoo	animal	zoology	The study of <i>animals</i>

TABLE 6.2 Common Prefixes

Prefix	Meaning	Example	Definition
ante-	before	antebellum	Before the war; especially in the U.S., before the Civil War
anti-	against	antifreeze	Liquid used to guard <i>against</i> freezing
auto-	self	automatic	<i>Self</i> -acting or <i>self</i> -regulating
bene-	good	benefit	An act of <i>kindness</i> ; a gift
circum-	around	circumscribe	To draw a line <i>around</i> ; to encircle
contra-	against	contradict	To speak <i>against</i>
de-	reverse, remove	defoliate	Remove the leaves from a tree
ecto-	outside	ectoparasite	Parasite living on the <i>exterior</i> of animals
endo-	within	endogamy	Marriage <i>within</i> the tribe
hyper-	over	hypertension	<i>High</i> blood pressure
hypo-	under	hypotension	<i>Low</i> blood pressure
inter-	between	intervene	Come <i>between</i>
intra-	within	intramural	<i>Within</i> bounds of a school
intro-	in, into	introspect	To look <i>within</i> , as one's own mind
macro-	large	macroscopic	<i>Large</i> enough to be observed by the naked eye
mal-	bad	maladjusted	<i>Badly</i> adjusted
micro-	small	microscopic	So small that one needs a microscope to observe
multi-	many	multimillionaire	One having <i>two</i> or <i>more</i> million dollars
neo-	new	neolithic	<i>New</i> stone age
non-	not	nonconformist	One who does <i>not</i> conform
pan-	all	pantheon	A temple dedicated to <i>all</i> gods
poly-	many	polygonal	Having <i>many</i> sides
post-	after	postgraduate	<i>After</i> graduating
pre-	before	precede	To go <i>before</i>
proto-	first	prototype	<i>First</i> or original model
pseudo-	false	pseudonym	<i>False</i> name; esp., an author's pen-name
retro-	backward	retrospect	A looking <i>back</i> on things
semi-	half	semicircle	<i>Half</i> a circle
sub-	under	submerge	To put <i>under</i> water
super-	above	superfine	<i>Extra</i> fine
tele-	far	telescope	Seeing or viewing <i>afar</i>
trans-	across	transalpine	<i>Across</i> the Alps

Although knowing the meanings of prefixes and roots can unlock the meanings of unfamiliar words, this knowledge should supplement, not replace, your dictionary use. Over the centuries, many prefixes have changed in both meaning and spelling. According to Lee Deighton, "of the 68 prominent and commonly used prefixes there are only 11 which have a single

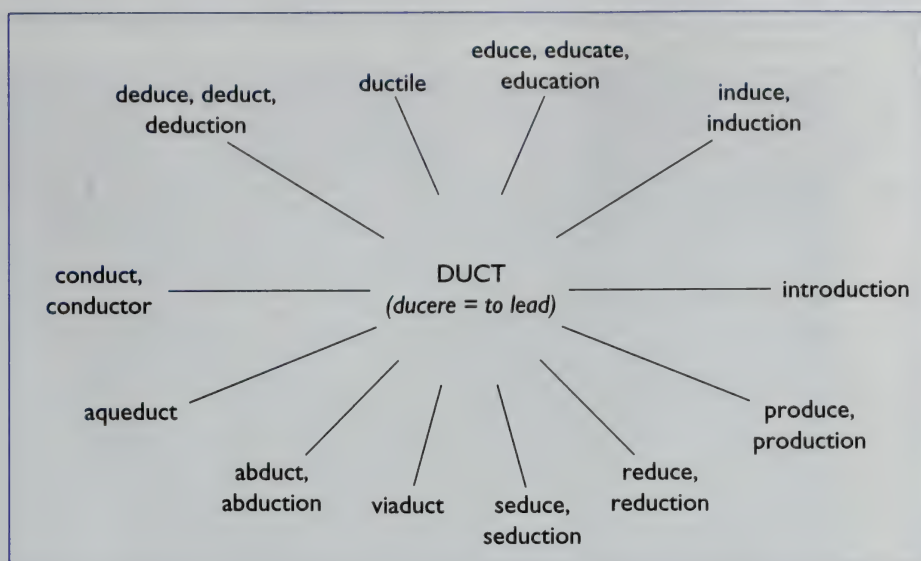


FIGURE 6.6 A Constellation of Words from One Root

and fairly invariant meaning.”¹¹ The other fifty-seven prefixes have more than one meaning each.

For example, the prefix *de-* means “of” or “from”; yet the dictionary lists four different meanings for it:

1. It means “down” as in *descend*, which means to pass from a higher to a lower place.
2. It indicates separation as in *dehumidify*, which means to separate moisture from air, or in *decapitate*, which means to behead—that is, to separate the head from the rest of the body.
3. It indicates reversal as in *decode*, which means to convert from code into ordinary language, or in *depreciate*, which means to lessen in value.
4. It may be used to intensify as in *demonstrate*, which means to show or prove publicly, or in *declare*, which means to announce.

So learn as many of the common prefixes and roots as you can, but learn them for better and more precise understanding of words you already know and words that you have yet to look up in the dictionary. When you go to the dictionary, make sure that you spend some time on the prefixes

¹¹Deighton, *Vocabulary Development in the Classroom*, p. 26.

TABLE 6.3 Fourteen Master Words—Key to Meanings of More than Fourteen Thousand Words

Words	Prefix	Common Meaning	Root	Common Meaning
Precept	pre-	(before)	<i>capere</i>	(take, seize)
Detain	de-	(away, from)	<i>tenere</i>	(hold, have)
Intermittent	inter-	(between)	<i>mittere</i>	(send)
Offer	ob-	(against)	<i>ferre</i>	(bear, carry)
Insist	in-	(into)	<i>stare</i>	(stand)
Monograph	mono-	(alone, one)	<i>graphein</i>	(write)
Epilogue	epi-	(after)	<i>logos</i>	(say, word)
Aspect	ad-	(to, towards)	<i>specere</i>	(see)
Uncomplicated	un-	(not)	<i>plicare</i>	(fold)
Nonextended	com-	(together with)		
	non-	(not)	<i>tendere</i>	(stretch)
	ex-	(out of)		
Reproduction	re-	(back, again)	<i>ducere</i>	(lead)
	pro-	(forward)		
Indisposed	in-	(not)	<i>ponere</i>	(put, place)
	dis-	(apart from)		
Oversufficient	over-	(above)	<i>facere</i>	(make, do)
	sub-	(under)		
Mistranscribe	mis-	(wrong)	<i>scribere</i>	(write)
	trans-	(across, beyond)		

James I. Erown "A Master-Word Approach to Vocabulary" by James I. Brown. Reprinted by permission from the May 1949 issue of WORD STUDY © 1949 by Merriam-Webster, Inc.. Publishers of the Merriam-Webster © Dictionaries.

and roots that make up each word. You will soon become convinced that a word is not an assemblage of letters put together like an anagram, but the true and natural outcome of evolution.

USING THE FOURTEEN MASTER WORDS

As mentioned earlier, it has been estimated that 60 per cent of the English words in common use are made up partly or entirely of prefixes or roots derived from Latin and Greek. To find out which prefixes and roots of Latin and Greek origin appear most frequently in English words, Professor James I. Brown, of the University of Minnesota, recorded the number of times certain word-elements appeared in an unabridged dictionary. He found that twenty prefixes and fourteen roots were part of fourteen thousand relatively common English words and of an estimated one hundred thousand words in that dictionary. He then compiled a list of common English words

that contained the twenty prefixes and fourteen roots among them. These words he called the *Fourteen Master Words*¹² (see Table 6.3).

The value of this list is that it illustrates the way much of our language is constructed. If learned, it can help you recognize and understand many words without resorting to a dictionary. With one well-understood root word as the center, an entire “constellation” of words can be built up, as was shown earlier in Figure 6.6.

THE WORD HISTORY SYSTEM

Every word has a history, a story. Learn the story and you’ll remember the word. Better yet, if you learn the life history of a word, the chances are great that you’ll get to like the word. To help you in this endeavor, at the end of each chapter, you’ll find both a picture and the story of the word, taken from *Picturesque Word Origins*, which is my favorite word-book. In the rest of this chapter, you’ll find additional ways to learn the histories of many words.

A word and its historical background have a magnetic way of holding on to each other. A good example of this bonding was my tussle with the word *ebullient*. Every time I encountered the word in my reading, I had to go back to the dictionary, and every time the dictionary would consistently give the definition as “zestfully enthusiastic.” But I just couldn’t get the definition to stick in my mind. You see, the “bull” portion of the word stuck in my mind and I kept picturing a bull charging; consequently, I looked at the word as conveying “aggressive behavior.” Of course, this concept was wrong.

To wipe from my mind this erroneous concept, I knew that I had to look up the word’s history in *The Oxford English Dictionary* (OED). There I found the history of *ebullient* from the time of its earliest recorded use up to the present. The OED showed that at one time the word meant “agitation, like boiling water; readiness to boil or bubble forth or overflow.” Gradually, over the years, this bubbling characteristic was applied to human beings. Thomas Carlyle (1795–1881), British historian and essayist, wrote of “the ebulliency of youth.”

Well, the upshot of all this research (it didn’t really take long, about ten minutes of reading) was that I no longer associate the word *ebullient* with “bull.” I now associate it with “boiling over with enthusiasm.” I can now see the dictionary definition of “zestful enthusiasm” as being correct and descriptively ingenious.

¹²Professor Brown’s findings are described in detail in the article “Reading and Vocabulary: 14 Master Words,” which appeared in the May 1949 issue of *Word Study*, published by G. & C. Merriam Co., Springfield, Mass.

My problem in remembering the meaning of the word *ebullient* was solved because the word was now set in a background obtained from *The Oxford English Dictionary*.

You see, a new word is like a gas-filled balloon. It's flighty. It tugs to float away. You can hold the meaning of a new word in your mind only as long as you think about it continually. But as soon as you turn to another task, the erosive force of forgetting, like an icy wind, blows the meaning of your still nascent word from your memory.

To forestall forgetting, the string on your gas-filled balloon has to be attached to a firm foundation. Fortunately, there are foundations to which you can attach your word-balloons. These foundations are the histories of words.

Why Are Histories of Words Important?

Once you know the history of a word, you'll most surely remember the word and its meaning, because now you have the word's "life story." The following excerpt helps to explain the value of word histories:

Words have lived for thousands of years and have played their parts in many lands and many civilizations. Words that you use today may have been the slang of Roman soldiers or the lingo of a Malay [native]. Thousands of our words are in themselves miniatures from the history of humanity—pictures of life in a dim past.¹³

What Books Contain These Histories?

There are probably many such books, but I can elaborate on only four: (1) *Picturesque Word Origins*, (2) *The Oxford English Dictionary*, (3) any unabridged dictionary, and (4) *The American Heritage Dictionary*.

Picturesque Word Origins This book is comprised of forty-five pictures, each depicting a specific word and accompanied by a paragraph explaining the word's origin and giving a brief history. At the end of each of the chapters in this book, you'll find a picture taken from *Picturesque Word Origins*. I have high regard for this book, because it has promoted great vocabulary improvement for all my students who have used it.

Here's the critical incident: During one six-week summer session, I had a class of thirty college-bound high school seniors. Having just one copy of *Picturesque Word Origins*, I loaned the book to each of the thirty students, one at a time, for just one overnight period. The next morning, of course, the book was handed to another student. On the last day of class, a final stan-

¹³From *Picturesque Word Origins*, Copyright 1933 by Merriam-Webster, Inc. Reprinted by permission.

dardized vocabulary test was given. The final score was compared to the initial vocabulary pretest. All students placed in the top two percentiles. A few had scores that were off the scale. All this improvement was achieved by means of just one overnight session with *Picturesque Word Origins*. I'm hoping that the pictures from this book will do the same for your vocabularies as they did for the vocabularies of my summer-session group.

Here are two lists of books that are sure to both arouse your interest in words and increase your stock of words. The out-of-print books are worth looking for in libraries; those still in print can be obtained from their publishers.

Books still in print

Giardi, John, *A Browser's Dictionary and Native's Guide to the Unknown American Language*. Published in 1980. Information and copies: Harper & Row Publishers, Inc., 10 East 53rd St., New York, NY 10022.

Funk, Charles E., *A Hog on Ice, and Other Curious Expressions*. Published in 1948. Information and copies: Harper & Row Publishers, Inc., 10 East 53rd St., New York, NY 10022.

Holt, Alfred H., *Phrase and Word Origins*. Published in 1961. Information and copies: Dover Publications, Inc., 31 E Second St., Mineola, NY 11501.

Hook, J. N., *The Grand Panjandrum*. Published in 1980. Information and copies: Macmillan Publishing Co., Inc., 866 Third Avenue, New York, NY 10022.

Maleska, Eugene T., *A Pleasure in Words*. Published in 1981. Information and copies: Simon & Schuster, 1230 Avenue of the Americas, New York, NY 10020.

Mathews, Mitford M., *American Words*. Published in 1959 and again in 1976. Information and copies: Philomel Books, 200 Madison Avenue, New York, NY 10016.

Word Mysteries & Histories. Published in 1980. Information and copies: Houghton Mifflin Co., 222 Berkeley St., Boston, MA 02116.

Out-of-Print Books

Ernst, Margaret S., *In a Word*. Published in 1939 by Alfred A. Knopf, New York.

Picturesque Word Origins. Published in 1933 by G. & C. Merriam Company, Springfield, MA.

It is good to end these few pages with a thought from the scholarly Edwin Newman:

... learning the subtleties and nuances of our common tongue can be not only instructive and rewarding, but fun.¹⁴

¹⁴Edwin Newman, Foreword to *Morris Dictionary of Word and Phrase Origins*. New York: Harper & Row, Publishers, 1977. By William and Mary Morris.

The Oxford English Dictionary This dictionary presents in alphabetical order the words that have formed the English vocabulary from the time of the earliest records down to the present day. Five million excerpts from English literature were amassed during preparation of the work; about 1,800,000 quotations were actually printed.

Actual work began in 1878, and the last page was delivered to the press on April 19, 1928. It took fifty years to produce all the volumes. On its completion in 1928, it was presented to King George V, and a copy was also officially presented to the president of the United States, Calvin Coolidge.

Here is a brief sample from the Oxford Dictionary. The word is *acre*.

- a. The historical spellings of *acre* are: *acer*, *aker*, & *akre*.
- b. The historical meanings of *acre*, in order of time, are:
 1. a piece of tilled land.
 2. as much as a yoke of oxen could plow in a day.
 3. consists of 32 furrows of the plow, a furlong in length.

[A furlong is about 220 yards.]

The ruling king had the power to stipulate weights and measures. For example, under Henry VIII, an acre was forty poles long and four poles wide. The measures, though varied, were rather similar throughout history.

Over the years, with each printing, the *OED* has increased in size. The latest edition, printed in 1989, consists of twenty volumes, made up of twenty-two thousand pages. Use this prodigious dictionary with gratitude and respect.

An Unabridged Dictionary Every library has an unabridged dictionary, which contains an almost inexhaustible amount of interesting and fascinating information. This information, mentally gathered in bits and pieces, has a way of jigsawing itself into a solid background. Here's what to do. Every time you use the dictionary, spend a few additional minutes mining its rich ores. You'll find the following items on almost every page.

Pronunciation. To make sure that you can pronounce the word correctly, notice how the word is divided into syllables, notice which syllables are stressed, and notice, too, whether the vowels are long or short. Finally, say the word aloud several times or until it rolls off your tongue smoothly and without hesitation. Repetition helps to imprint the word in your mind.

Dictionaries often have extended explanations on how a word should be pronounced. Reading this information helps you to be more certain that you are pronouncing a word correctly. Such explanations are generally interesting. Here is an example:

Often was pronounced with a t-sound until the 17th century, when a pronunciation without the (t) came to predominate in the speech of the educated, in

both North America and Great Britain. Common use of the spelling pronunciation has since restored the (t) for many speakers, and today both pronunciations exist side by side. Although it is still sometimes criticized, *often* with a (t) is now so widely heard from educated speakers that it has become fully standard once again.¹⁵

To speak with a sense of assurance can be a great asset not only in college, but also in every aspect of your continuing activities.

Prefixes and suffixes. Look at the end of a word's definitions. There you'll find reference to any prefixes or suffixes used in the word itself. Study the parts to see the basis for the word's meaning.

For example, throughout your college days you'll often encounter these two phrases:

1. Inductive reasoning = the process of deriving general principles from particular facts
2. Deductive reasoning = the process of reasoning from the general principle to the specific fact

The root *dūcere*, meaning "to lead," is the same for both words; so, the prefix makes the differentiation:

1. The prefix *in* means "in" or "into."
2. The prefix *de* means "from" or "away."

So, for easy remembering and to build a solid background, think:

1. Inductive = (upward)—from parts to the whole principle
2. Deductive = (downward)—from the whole principle to the parts

Use prefixes and suffixes as additional bricks in building your vocabulary background.

Suffixes. In some ways, suffixes can be more helpful than prefixes in understanding words. And—the best part—learning and remembering a handful of suffixes is relatively easy.

For example, we come across many medical words, such as *laryngitis* and *tonsillitis*. Once we know that the suffix *-itis* means "inflammation or disease of," we see how logically the words were put together, and their meanings become obvious—and, as I said, with hardly any work at all.

Once we know the suffix *-ectomy*, which means "surgical removal," the words *laryngectomy* and *tonsillectomy* and *appendectomy* are no longer the sole possession of doctors. We, too, know and can use them.

Take the suffix *-icide*, which means "killer"; now the words *insecticide* and *germicide* become fully understandable.

¹⁵*The Random House Dictionary of the English Language*, Second Edition, Unabridged. New York: Random House, Inc., Copyright © 1993, p. 1346.

Finally, take from the dictionary words and pieces of words that will help you, brick by brick, build a strong, permanent background.

Multiple definitions. You'll find that most words have several meanings. These will be numbered in the dictionary. Recently, I received a letter from a friend who wrote, "I attended a long seminar on Vladimir Nabokov," the Russian-born American writer, most notably of the satirical *Lolita*. He continued, "All the experts were there. Lots of discussion, but it was too precious for me." I was startled. The word precious, to me, meant something valuable. Instantly, I paged through the dictionary and found four definitions. Here they are:

1. Of high cost or worth; valuable
2. Highly esteemed; cherished
3. Dear; beloved
4. Affectedly dainty or overrefined: *precious mannerisms*

The fourth definition was the one that slid into the context of my friend's sentence perfectly. "Overrefined" was the answer.

By reading all the definitions of a word, we weave more strong strands into the background of each word we look up. This will enable us to later use and understand such words with greater correctness and precision.

A general comment: There are many more interesting and helpful aspects—too numerous to mention in this chapter—of an unabridged dictionary. Look at the front pages of the dictionary to find out about such special features.

The American Heritage Dictionary This is an abridged dictionary; that is, a condensed version of an unabridged dictionary. Yet unlike most abridged dictionaries, this one has many of the special features that, as a rule, only unabridged dictionaries incorporate. This is why I appreciate having this wonderful resource at my elbow.

Synonyms. What an opportunity to weave more strands into your background! Finding a cluster of synonyms is like finding a cache of gold nuggets. But watch out. Not all words in a cluster are interchangeable. Each word has a color and flavor and niche of its own. It fits perfectly in a specific context where its meaning, feeling, and tone are just right.

Take, for example, this cluster of common synonyms: *eat, consume, devour, ingest*. The central meaning shared by these verbs is "to take food into the body by mouth." Now, notice the appropriate contexts:

ate a hearty dinner; greedily *consumed* the sandwiches; hyenas *devouring* their prey; whales *ingesting* krill.¹⁶

¹⁶The American Heritage Dictionary of the English Language. 3rd ed. (Boston: Houghton Mifflin, 1992), p. 580.

There is nothing that can give more preciseness to your words than knowing the fine differences among synonyms.

Usage Notes. A form of this category is found in almost all unabridged dictionaries, but rarely in abridged dictionaries. Such notes are interesting and instructive. Here is an example:

USAGE NOTE: In nautical usage *knot* is a unit of speed, not of distance, and has a built-in meaning of “per hour.” Therefore, a ship would strictly be said to travel at ten knots (not ten knots per hour).¹⁷

Usage notes impart information in an easy-to-read, nontechnical, nonobfuscating manner.

Word History. In the previous pages, the book *Picturesque Word Origins* was described. Such books may not be readily available, but the word history items in most unabridged dictionaries can serve as very good substitutes. A plus factor is that these histories are written in an easy-to-read narrative manner. Here’s a sample:

The identity of the Pueblo peoples is undeniably connected to the stone and adobe dwellings they have occupied for more than 700 years—especially from an etymological point of view. Originally coming from the Latin word *populus*, “people, nation,” the Spanish word *pueblo*, meaning “town, village,” as well as “nation, people,” was naturally applied by 16th-century Spanish explorers to villages they discovered or founded in the Southwest.¹⁸

Next time you look up a word in an unabridged dictionary, linger a few minutes longer to read one or two of these word histories.

FINAL WORDS

Thus far in this book, you’ve seen how words have shaped the life of Malcolm X. Words can shape your life and career as well. Yes, I know that your major academic effort is to prepare for your future career and employment. Once you are established in your career, professional progress will depend, of course, on your work skills; but your ability to use words—to express yourself clearly and convincingly—may well be the real propellant in climbing the ladder. So, let the building of vocabulary go hand in hand with building your career skills.

¹⁷Ibid., p. 998.

¹⁸Ibid., p. 1465.

SUMMARY

Is there really a connection between a good vocabulary and success?

Yes. Information is power, and the only way to send and receive information effectively is with the help of a large, wide-ranging vocabulary.

What is the best way to build up my vocabulary?

The best way to improve your vocabulary is to get into the habit of using your dictionary. When you don't know a word, look it up.

Can't I simply figure out a word's meaning from context?

Context can give you a rough idea of a word's meaning, but it has three limitations: (1) Context provides the meaning of a word in a very specific instance. (2) It gives you a synonym rather than a bona fide definition. (3) It requires you to do guesswork, which may or may not be correct.

What kind of dictionary should I use?

Few students can afford to buy an unabridged dictionary; however, most libraries keep several unabridged dictionaries for reference. Nevertheless, you should buy a good abridged dictionary to use when you are studying at your desk. You might also want to buy a pocket dictionary to carry around with you.

Is there any point in studying prefixes, suffixes, and word roots?

Yes. Sixty percent of the words commonly used in English have Latin or Greek prefixes and roots. The ability to recognize and understand the meaning of these word parts can give you a real edge.

What can be done to make vocabulary building a productive adventure?

You need a sense of interest, a sense of excitement, a sense of wonder, and a feeling of pleasure to make vocabulary building productive. One way to gain all four is by becoming *interested* in the origin of words.

How can I learn difficult words that turn up in my textbooks or in lectures?

Mastering words takes constant practice. The most effective way to get this sort of practice is by putting difficult words encountered in your textbooks and class lectures on 3 × 5 cards.

What's the advantage of 3 × 5 cards?

Such cards are portable. You can easily carry a stack of cards in a pocket or purse so they'll be available whenever you have a little free time.

What should I write on the cards?

Put each word on a separate card. Write the word and the sentence or phrase in which it occurs on the front of the card. Look up the word in a dictionary, and write its phonetic spelling on this side as well. On the back of the card, put the word's definitions as well as its derivation.

How do I study from the cards?

To master the word, pronounce it; read it in context; and then define it without looking at the back of the card. Then check the back to see whether you were correct. Go through a handful of vocabulary cards until you feel secure that you have mastered them.

What is the Frontier Vocabulary System?

The Frontier Vocabulary System is a vocabulary-building method that focuses on words that are slightly familiar to you rather than totally unknown. If you try to learn a word that is totally unknown to you, the chances are great that you will never remember it. But if you learn a word that lies in the frontier area of your vocabulary, you are likely to hold on to its meaning. What's more, with each new word you learn you'll be pushing into the zone of unknown words.

Should I find my own frontier words, or should I use an expert's list?

Make up your own list. Use words that *you* are slightly familiar with, rather than words that an expert has chosen for you.

How do I find my own frontier words?

There are four ways to start accumulating a list of frontier words: (1) Pay attention to the words that you use routinely in conversation. Are you sure that you are clear about their meanings? (2) Look for words that you recognize in reading but never use when you speak. There's a good

How do I master these frontier words?

What makes the book *Picturesque Word Origins* such a superior learning device?

Do we really use silent speech when we think?

Why did you include Malcolm X in this chapter?

chance that they are frontier words. (3) Listen to the conversations of others and see whether they use words that you would like to master. (4) Learn the antonyms of the frontier words that you find. Learning words in pairs does a great deal to cement them in your memory.

Write each frontier word on a 3 × 5 card. Treat and study these words just as you treat the difficult words encountered in your textbooks and in lectures. Master the words by reading the front of the card out loud and reciting the word's definition from memory. Then check your progress by flipping over the card.

It jump-starts the interest-in-words motor. Once you see the Anglo-Saxon farmer with one hand on the wheeled plow and the other hand waving to a nearby farmer, you instinctively feel the warm relationship between the two people. The picture and feeling will be mentally emblazoned, and you will henceforth always associate the word *neighbor* with the picture. Best of all, you'll always remember what *neighbor* really means.

Yes, we do. Try it on yourself; that is, when you are thinking, "peek in" on yourself and you'll find that you are "talking" to yourself—using words, of course. The words do not have to be in grammatically correct form, but you'll find you're using words.

To give you real people to visualize. Visualization leads to internalization, which is necessary in establishing a motivational source. It's hard to internalize just a string of explanatory words. Yes, we visualize, then internalize. Internalization makes what we visualize a part of our inner selves.

I like your story about the words *optimistic* and *pessimistic*. Is it a true story?

How did you come up with the idea of increasing interest in vocabulary by reading newspapers?

Why the Word History System?

Isn't *The Oxford English Dictionary* more than we need?

Could you use only an unabridged dictionary instead of the *OED*?

Thank you. Yes, it's a true story. I firmly believe that when you increase your vocabulary, you increase your intelligence. Look at Malcolm X. He saw what words could do. So he filled his mind with them and made something of himself.

It was not the work of a genius. The newspaper is an excellent way to make increasing your vocabulary a constant, everyday event. As a bonus, you'll become a better writer. Somehow it grows on you. Because it works! It's an honest system. There are no gimmicks. There are no promises of an easy ride to vocabulary greatness. Like any good thing, you have to work for it. Also, it's a genuinely scholarly method. Last, it can be truly fun. Looking up a word can be a wonderfully serendipitous adventure.

Yes, it's far more than you need; but remember, it's the most complete source of English words in all the world. You don't have to eat the whole bushel of apples. One is probably enough. So, go to the best and take only what you need.

Yes, you could. An unabridged dictionary is loaded with all kinds of information. As a constantly available source, I like *The American Heritage Dictionary* published by Houghton Mifflin. It has all the special items described in this chapter. It's very readable, and in the margins there are helpful illustrations. However, do yourself a favor and hold a few brief sessions with the *OED*, just for the experience.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. There is a close relationship between a good vocabulary and _____.
prefixes synonyms success
2. New vocabulary words should always be written in _____.
pairs context cursive
3. Definitions in most pocket dictionaries consist mainly of _____.
synonyms derivations antonyms
4. There is a close relationship between a good vocabulary and _____.
personality mental ability philosophy
5. Pictured words are more _____.
enjoyable graphic memorable
6. All thinking is done mainly by using words _____.
graphically gramatically silently

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|--|--|
| _____ 1. Accommodation | a. May reveal the meaning of a new word |
| _____ 2. 60 | b. Takes on a specific meaning when used in psychology |
| _____ 3. Constellation | c. Percentage of English words derived from Latin or Greek |
| _____ 4. 57 | d. Word beginning |
| _____ 5. Context | e. Zone of vocabulary used in reading, writing, speaking, and thinking |
| _____ 6. Prefix | f. Number of common prefixes that have multiple meanings |
| _____ 7. Known words | g. A group of words with a common root |
| _____ 8. Frontier area | h. Greatest learning takes place here |
| _____ 9. Malcolm X | i. Word histories |
| _____ 10. <i>The Oxford English Dictionary</i> | j. Influenced by Bimbi |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- ___ 1. A powerful vocabulary can be acquired very quickly.
- ___ 2. No word is ever fully defined.
- ___ 3. Keywords and terms from your courses should be mastered like frontier words.
- ___ 4. A knowledge of prefixes, suffixes, and roots will eliminate any need for the dictionary.
- ___ 5. Antonyms of words you already know can make excellent frontier words.
- ___ 6. Robert A. Hall, Jr., maintains that we can read and write in complete silence.

Multiple choice. Choose the phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Three dots on a vocabulary card indicate that the word
 - a. has three different definitions.
 - b. may require extra attention.
 - c. has been properly mastered.
 - d. consists of a common prefix and root.
2. Frontier words are
 - a. inexhaustible in their supply.
 - b. the easiest words to master.
 - c. familiar in one way or another.
 - d. all of the above.
3. The main value of the unabridged dictionary over an abridged one is that it presents more
 - a. synonyms.
 - b. definitions.
 - c. word histories.
 - d. prefixes.
4. A nautical knot is a unit of
 - a. distance.
 - b. speed.

- c. depth.
 - d. drift.
5. According to the author, the mind is developed through
 - a. maturation.
 - b. experience.
 - c. growth.
 - d. words.
 6. According to Robert A. Hall, Jr., and the author, silent speech goes on while you are
 - a. reading.
 - b. writing.
 - c. thinking.
 - d. doing all of the above.

Short answer. Supply a brief answer for each of the following questions.

1. Lee Deighton writes that an *interest in words* is the prime requirement for building a vocabulary. Do you agree? Why?
2. A pocket dictionary is invaluable for building vocabulary. Can you think of two reasons why it works?
3. The 3×5 vocabulary card is recommended for mastering words. Can you think of two reasons why this system works?
4. S. I. Hayakawa suggests that words should be understood in relationship to other words. Why?
5. What is the basis for the Word History System. Does the system work? If not, why not?
6. What makes the sentence "You never sausage a thing" so effective? Explain.
7. How and why does a firm background on a word help to forestall the forgetting of it? Explain.

THE WORD HISTORY SYSTEM

neighbor neigh'-bor *n.* 1. One who lives near or next to another. 2. A person, place, or thing adjacent to or located near another. 3. A fellow human being.

Neighbor: *once a nearby farmer*



Neighbor is one of those interesting words that carry us back to Anglo-Saxon days. In Anglo-Saxon, *néah* meant “nigh,” “near,” and *gebūr* meant “dweller,” “farmer.” These two words were combined into *néahgebūr*, meaning, literally, “a nearby farmer.” Its meaning, changing with the evolution of civilization, no longer applies particularly to neighboring farmers, but refers to persons living near each other. Even nations in the modern world are called “neighbors”—an interesting development of a word that means, literally, “nearby farmers.”

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

When strangers start acting like neighbors, communities are *reinvigorated*.

—Ralph Nader (1934–), American lawyer, pioneer in consumer protectionism

- | | | | |
|-----------------------------|----------------------|------------------------|-------------------|
| 1. are <i>reinvigorated</i> | given new
leaders | given old
standards | given new
life |
|-----------------------------|----------------------|------------------------|-------------------|

If you help others, you will be helped, perhaps tomorrow, perhaps in one hundred years, but you will be helped. Nature must pay off the debt. It is a *mathematical* law and all life is mathematics.

—George Ivanovitch Gurdjieff (1872–1949), Armenian mystic and philosopher

2. a *mathematical* law probable improbable absolute

It is one of the most beautiful *compensations* of life that no man can sincerely try to help another without helping himself.

—Ralph Waldo Emerson (1803–1882), American writer and philosopher

3. *compensations* of life thoughts acts rewards

IMPROVING YOUR READING SPEED AND COMPREHENSION

When we read too fast or too slowly, we understand nothing.

—BLAISE PASCAL (1623–1662), FRENCH PHILOSOPHER,
MATHEMATICIAN, AND SCIENTIST

Almost anyone who reads can read faster. The way to do so, however, is to strengthen your natural way of reading and thinking—not to use some artificial method. This chapter includes information and expert research on:

- Eye movements during reading
- How much the mind can see
- Vocalization while reading
- Eight ways to increase speed and comprehension

IMPROVING YOUR READING SPEED AND COMPREHENSION

Eye Movements During Reading

Facts About Eye
Movement and Speed-
Reading

An Experiment with
Eye Movement

How Much the Mind Can See

The Limitation
of the Mind

Speed-Reading
and Remembering

Vocalization While Reading

A Natural Way to Read Faster

Establish a Base
Be Flexible
Follow Ideas, Not Words
Ignore Your Eye Fixations
Enjoy the
Concluding Paragraph

Eight Ways to Improve Reading

Intonation
Vocabulary
Background
Edward Gibbon's
Paragraph
Page-at-a-Time
Daniel Webster's
Skimming

The simple question “How can I improve my reading?” does not have a simple answer. There are many different purposes in reading, many different reading techniques that can be used, and many ways in which reading can be “improved.” However, when this question is asked by a student, it usually means, “How can I *speed up* my reading so I can finish my homework in half the time with high comprehension and almost complete retention?” There is no easy way to do so, despite the numerous brochures, newspaper and magazine articles, and television programs that extol the marvels of “speed-reading.” Many students, as well as the general public, are convinced that speed-reading is a technique that is easy to learn and that can be used with any page of print. Unfortunately, speed-reading is virtually useless to anyone who desires to learn from the printed page.

If you desire high comprehension and almost complete retention, you must use systematic study techniques. There is no other way to master your courses. This entire book is devoted to making learning a reality through the use of efficient study skills. This chapter focuses on specific skills you can use in reading. Before examining them, however, we must discuss two aspects of reading: eye movements and vocalization. In doing so, we emphasize some negative aspects of speed-reading, for two reasons. First, academic improvement through speed-reading is just not in the cards, so don’t spend your time, money, and energy on this dead end. Second, by clearing the decks of so-called easy ways to read and study, we set the stage for reading and studying systems that work.

EYE MOVEMENTS DURING READING

Not surprisingly, eye movements play a critical role in reading. But the facts about eye movements and certain advertising claims are at odds. Let’s take a look at the subject.

Facts About Eye Movements and Speed-Reading

Newspapers have carried sensational stories about high school students who read at astronomical speeds. One student was clocked at the rate of 40,000 words per minute. Another student was timed at 50,000 words per minute! A peculiar characteristic of all such stories is that they include the statement “with nearly 100 percent comprehension.”

How fast is 40,000 words per minute? There are about 300 words on an average paperback book page. By dividing 300 into 40,000, we find that to read 40,000 words per minute, a person would have to read 133 pages per minute! The reader (or, more accurately, the page turner) would have less than half a second to spend on each page. Some students find it difficult to *turn* 133 pages in a minute, let alone see any words on those pages. Readers who are fast page turners might be able to see a word or two on each page as it flutters by, but this would hardly lead to “nearly 100 percent comprehension.” Such readers could not possibly reconstruct the ideas contained in the 133 pages.

The basic premise of speed-reading advocates is this: The eye is able to see a vast number of words in one fixation. (A *fixation* is a focusing of the eyes on an object. The eyes must pause—they must be still—to fix on the object.) Some advocates say the eye can see phrases at a glance; others say entire lines; still others say paragraphs at a time; and a few say the eye can see an entire page at a glance. Let’s look at the facts.

Eye-movement photography shows that the average college student makes about four eye fixations per second. Eye-movement photography also shows that the eye sees an average of only 1.1 words during each fixation. Seldom does any person, trained or untrained, have a usable span of recognition of more than 2.5 words.¹ Recent research using computers shows that good readers take in an average of about ten usable *letters* per fixation: four letters to the left of the center of fixation and five or six letters to the right of the center of fixation.² Thus, a reader may take in less than one long word, such as *informational*; or one complete word, such as *basketball*; or more than one word, such as *high grade*.

These facts indicate that only a most unusual person can see 10 words per second (2.5 words per fixation \times 4 fixations per second). So, in sixty seconds it is arithmetically possible for the eye to take in 600 words. This calculation does not include the time needed to return the eyes to the beginning of each line and to turn pages.

There is no evidence that anyone’s eyes can see a whole line of type “at a glance.” So any advice to run your eyes down the middle of a page or column, to speed-read the page, is nonsense. All you’ll get is a word or two from each line—a handful of scrambled words.

Richard Feinberg³ reported that when a reader focuses on a word, “only four to five letters immediately around the fixation point are seen with 100

¹Stanford E. Taylor, “Eye Movement in Reading: Facts and Fallacies,” *American Educational Research Journal* 2, no. 4 (November 1965): 187–202.

²John M. Henderson and Fernanada Ferreira, “Effects of Foveal Processing Difficulty on the Perceptual Span in Reading: Implications for Attention and Eye Movement Control,” *Journal of Experimental Psychology: Learning, Memory and Cognition* 16, no. 3 (1990): 417–429.

³Richard Feinberg, “A Study of Some Aspects of Peripheral Visual Acuity,” *American Journal of Optometry and Archives of American Academy of Optometry* 26 (February–March 1949): 1–23.

percent acuity" (sharpness). The letters of words half an inch from the point of fixation are seen with only 40 percent acuity, and those one inch from the point of fixation seen with only 26 percent acuity. If the reader has less than normal vision, the fall-off in acuity is even more pronounced.

An Experiment with Eye Movements

Here's how to find out how your eyes move during reading. Use any page of print, such as the text shown in Figure 7.1, copied on a half-sheet of paper. Punch a hole near the center of the page, as at the dot in Figure 7.1. Hold the page close to your own eye, with the printed side facing toward another person (the reader). As the reader silently reads the printed matter, watch his or her eyes through the peephole. You will immediately notice that the reader's eyes do not flow over the lines of print in a smooth, gliding motion. Instead, the eyes seem to jerk their way across the page, alternating fast, forward movements with momentary pauses, much like a typewriter carriage. The pauses are absolutely necessary, for they allow the eyes to focus on the type, to get a clear image of it. When the eyes are in motion, they record nothing but a blur on the retinas.

A knowledge of words, what they are and how they function, is the first and last essential of all liberal education. As Carlyle says, "If we but think of it, all that a University or final highest school can do for us is still but what the first school began doing—teach us to read." When a student has been trained to make the words of any page of general writing yield their full meaning, he has in his possession the primary instrument of all higher education.



In these days when the nation is asking that its schools produce good citizens first and specialists second, there is a marked need for a rich and wide "universal" training of the mind. This book on reading is designed to forward the process by which the whole mind, intellectual and emotional, becomes a more accurate instrument for the reception and transmission of thoughts and sensations. If our system of education does not so train the minds of its students, if it does not teach them to recognize differences, to distinguish shades of meaning, to feel as by intuition not only the hypocrisy of the demagogue and the flattery of the bootlicker but also the depth of a statesman like Lincoln and the insight of a poet like Shakespeare, it fails of its purpose.

FIGURE 7.1 The Peep-Sight Experiment

See the text discussion for instructions. Source: From E. A. Tenney and R. C. Wardle. *Intelligent Reading* (New York: Crofts, 1943), preface.

Instructions to the Reader When you read the material, actually slow down your rate so that your partner will be able to count, as well as carefully observe, your eye movements. Don't try to manipulate your eyes in some unnatural way, such as by trying to focus on an entire line in one fixation; it won't work.

Calculations You can make a rough calculation of the number of words perceived by the eyes by dividing the number of eye pauses into the total number of words on a line. For example, if the first line contains twelve words and the reader pauses eight times, the reader is taking in roughly one and one-half words per fixation.

HOW MUCH THE MIND CAN SEE

Our emphasis has been on the question "How many words can the eyes see in one fixation?" A more basic question is "How does the mind process the words that are imprinted on the retina of the eyes?" Suppose the eyes take in two words at a single fixation. Does the mind impose a meaning on both words instantly and simultaneously, or must it consider each word in sequence, one at a time, to get at the meaning of each word? If the mind can handle only one word at a time, however swiftly, wouldn't it be easier for the eyes to deliver to the mind one word at a time in the first place?

The Limitation of the Mind

Research done at the Massachusetts Institute of Technology, using MIT undergraduates, gives scientific evidence that the mind can attend to only one word at a time. The researchers concluded that "even the skilled reader has considerable difficulty forming a perception of more than one word at a time."⁴

You often have the impression that you are seeing more than one word at a fixation because your eyes are moving rapidly from left to right, taking in words in rapid sequence. This process is almost like watching a movie. Although each film frame is a still picture, you "see" motion and action when the film is projected at a rate of twenty-four frames per second. Similarly, words projected on the brain at the rate of seven or eight words per

⁴Paul A. Kolars, "Experiments in Reading," *Scientific American* 227, no. 1 (July 1972): 84-91.

second give the impression of living, moving ideas. Nevertheless, the brain is "viewing" only one word at a time.

Speed-Reading and Remembering

A final objection to speed-reading is that it does not give the mind time to consolidate new information.⁵ Even if your eyes were able to take in several thousand words a minute (impossible) and your brain were able to comprehend the meaning of them all (impossible), your mind would not have time to consolidate the meaning before it was assaulted by the next batch of several thousand words. As you saw in Chapter 5, the brain requires a certain period of time in which to convert a temporary idea to a permanent one.

VOCALIZATION WHILE READING

For many years it has been thought that vocalizing while reading is a bad habit that should be eliminated. There are four types of vocalizers: the person who whispers each word aloud; the one who pronounces each word with lip movements; the one who moves only the vocal cords; and the one who thinks the sound of each word. Those who want to eliminate vocalization claim that vocalizing slows reading speed. This claim is probably true. However, the assumption that vocalization can and should be eliminated is highly questionable because there is no research to support it. On the contrary, there is strong evidence that vocalization of one kind or another is an essential part of all reading.

Robert A. Hall, Jr., an internationally known linguist, has this to say about vocalization, or inner speech:

It is commonly thought that we can read and write in complete silence, without any speech taking place. True, many people learn to suppress the movements of their organs of speech when they read, so that no sound comes forth; but nevertheless, inside the brain, the impulses for speech are still being sent forth through the nerves, and only the actualization of these impulses is being inhibited on the muscular level, as has been shown by numerous experiments. No act of reading takes place without a certain amount of subvocalization, as this kind of "silent speech" is called, and we normally subvocalize, when we write, also. Many slow readers retain the habit of

⁵R. S. Woodworth and H. Schlosberg, *Experimental Psychology* (New York: Holt, 1954), p. 773.

reading out loud, or at least partially moving their lips as they read; fast readers learn to skip from one key point to another, and to guess at what must lie in between. The good rapid reader knows the subject-matter well enough to guess intelligently; the poor reader does not know how to choose the high spots or guess what lies between them. As the rate of reading increases, the actual muscular movements of pronunciation are reduced; but, just as soon as the going gets difficult, the rate of reading slows down and the muscular movements of pronunciation increase again, even with skilled rapid readers.

From these considerations, it is evident that the activities of speaking and reading cannot be separated. Curiously enough, literary scholars are especially under the delusion that it is possible to study "written language" in isolation, without regard to the language as it is spoken; this is because they do not realize the extent to which, as we have just pointed out, all reading and writing necessarily involve an act of speech on the part of both writer and reader.⁶

Åke Edfeldt, of the University of Stockholm Institute of Reading Research, has studied vocalization with a team of medical doctors who used electrodes to detect movement in the lips, tongues, and vocal cords of volunteer readers. After exhaustive medical tests, Edfeldt concluded:

On the basis of the present experimental results, earlier theories concerning silent speech in reading may be judged. These theories often appear to have been constructed afterwards, in order to justify some already adopted form of remedial reading. In opposition to most of these theories, we wish to claim that silent speech occurs in the reading of all persons.

In any case, it seems quite clear that all kinds of training aimed at removing silent speech should be discarded.⁷

Decades ago, E. L. Thorndike (1874–1949), American psychologist and lexicographer, said that "reading is thinking." Psychologists agree that thinking is silent speech. So if reading is thinking, and thinking is silent speech, then reading must also be silent speech. It seems that if we spend our time and energy trying to knock out vocalization, we are in fact trying to knock out comprehension. Vocalization cannot and should not be eliminated, because it is part of the reading process.

A NATURAL WAY TO READ FASTER

Speed-reading methods cannot be effective if they interfere with natural processes or if they require that we read in a way that isn't natural to us.

⁶Robert A. Hall, Jr., *New Ways to Learn a Foreign Language* (New York: Bantam Books, 1966), pp. 28–29.

⁷Åke W. Edfeldt, *Silent Speech and Silent Reading* (Chicago: University of Chicago Press, 1960), p. 154.

For example, vocalization is a natural and necessary function; methods that attempt to eliminate vocalization so as to increase reading speed cannot succeed. Methods that impose an artificial eye-fixation scheme must likewise fail.

The only effective way to increase your reading speed is to do so naturally—to do exactly what you have been doing but do more of it or do it faster. The method described in this section will help you read faster naturally. However, you must realize that it is *not* meant for textbook reading, where you must read (and often reread) slowly, to get the full meaning of each sentence and paragraph. Use the method to increase the speed at which you read novels, magazines, journals, and newspapers. To read these materials at the slow textbook rate is a waste of your time; in such cases, the mind is eager to sprint, but the textbook reading habit limits it to a deliberate pace.

Here are five things to do or to keep in mind as you practice faster reading. They are fairly general in nature, but they are important to the method. Further on, you will see, step by step, how to practice faster reading to increase your reading speed.

Establish a Base

Before you begin to read a new book, take a few minutes to think about its title and to look through the table of contents. Extract as much meaning as possible from both. For example, if your book were *The Adventures of Sherlock Holmes*, you would know that you had a handful of absorbing detective stories to read. Knowing the nature of the book will create a mindset highly favorable to reading; it will be derived from the two powerful forces of anticipation and concentration.

Be Flexible

Match your reading speed to the material you are reading. If the book begins with introductory, “warm-up” material, move through it fast. But slow down a bit when you come to the first solid paragraph. You need to grab and hold in mind items such as names, places, and circumstances, for these are the magnetic centers around which ideas and details will cluster as you sprint through the pages. When the going gets easier, speed up again. As you read, be continually alert to slow down at paragraphs that are full of ideas and to speed up when you can. There is no reason to expect—or try—to read at a constant rate.

Follow Ideas, Not Words

Don't try to remember words. Simply use the words to visualize the ideas, facts, and actions that the author is presenting. Once you have done so, let the words drop out of your mind. Retain only the development of the story or the important ideas and facts.

Ignore Your Eye Fixations

Don't think about what your eyes are doing, for that will break both your reading rhythm and your concentration. The eye fixations will take care of themselves easily and naturally as you read along at your own pace. You don't need to think about eye fixations any more than you need to think about moving your feet while you walk. The feet take care of themselves, and so do the eyes.

Enjoy the Concluding Paragraph

Slow down for the last paragraph, and savor it. You will enjoy seeing how the author connects the various facts or events in an article or the various parts of a short story or novel.

This whole process—establishing a base, being flexible in reading speed, following ideas, ignoring eye movements, and enjoying the conclusion—leads not only to faster reading but to intelligent reading as well.

EIGHT WAYS TO IMPROVE READING

Reading comprehension cannot be improved through mechanical techniques like turning pages faster or moving the eyes in some artificial pattern. There is no magic in such actions. The magic comes only when you work at your reading skills.

Most methods for improvement suggested in this chapter require hard work, but the rewards are great. A few of them require only the willingness to try a new way of using old knowledge.

The Intonation Way

As we have seen at the beginning of this chapter, vocalization is part of the process of reading and comprehending. The most efficient use of vocaliza-

tion, to read faster with a high degree of comprehension, is through *intonation*, which is the rise and fall of the voice in speaking. Reading with intonation means reading with expression. Intonation provides a natural means for combining individual words into meaningful mental “bites.”

To use this system, let your eyes move rapidly across the page as usual. You need not make any sound, but let your mind swing along each line with an intonational rhythm that can be heard by your “inner ear.” Read with expression. In doing so, you will be replacing the important *rhythm*, *stress*, *emphasis*, and *pauses* that were taken out when the words were put into written form.

To make silent intonation a regular habit, start by reading aloud in the privacy of your room. Spend ten or fifteen minutes on one chapter from a novel. Read it with exaggerated expression, as if you were reading a part in a dramatic play. This will establish your own speech patterns in your mind, so that you will “hear” them more readily when you read silently.

The Vocabulary Way

There is probably no surer or sounder way to improve your reading permanently than by building a strong, precise vocabulary. In a precise vocabulary, every word is learned as a concept. You know its ancestry, its principal definition as well as several secondary definitions, its synonyms and the subtle differences among them, and its antonyms. Then, when you encounter it in your reading, this vast store of knowledge flashes before you, illuminating the sentence, the paragraph, and the idea the author is trying to convey. For more on vocabulary building, refer to Chapter 6.

The Background Way

You can improve your reading tremendously by reading good books. The first reason for this is that you’ll be getting a lot of practice. Even more important, you’ll be storing up a stock of concepts, ideas, events, and names that will lend meaning to your later reading. This kind of information is used surprisingly often.

Psychologist David Ausubel says that the most crucial prerequisite for learning is your already established background of knowledge.⁸ Ausubel

⁸D. R. Ausubel, J. D. Novak, and H. Hanesian, *Educational Psychology: A Cognitive View*, 2nd ed. (New York: Holt, Rinehart & Winston, 1978).

means that if you are to understand what you read, then you must interpret it in the light of knowledge (background) you already have. A background is not something you are born with. You accumulate one through both direct and vicarious experiences. The vicarious experiences, of course, are those you acquire by listening, seeing films, and reading books.

Authors often make allusions to famous books, famous people, or well-known events. In many cases, you can miss these references and still understand the story. In some instances, however, an allusion will be crucial, and you will have to search for its meaning if it is not in your background. Consider this short passage by Robert Louis Stevenson (1850–1894), Scottish novelist and poet:

And not long ago I was able to lay by my lantern in content, for I found the honest man.

This sentence is composed of twenty simple words, many consisting of only two and three letters. It contains one word that is crucial to the understanding of the sentence. Go back and see whether you can pick it out before you read on.

The two words most often chosen are *honest* and *content*. Neither is the crucial word. That word is *lantern*. It is, however, no ordinary lantern to which Stevenson refers, but one that is associated with a real person in history. Whose lantern? The lantern of Diogenes. Diogenes was a fourth-century B.C. Greek cynic and critic who walked the streets of Athens during the daytime, holding a lighted lantern, peering into the faces of passers-by, and saying that he was looking for an honest man. He was dramatizing the idea that it is difficult to find an honest man, even with a lighted lantern during the day.

Obviously, without knowing the story of Diogenes you cannot fully understand Stevenson's line, and that is only one example from millions. You cannot make every fact, myth, story, and poem part of your background. But you can, through your reading, enlarge your background and thus increase the effectiveness of your reading. In other words, you can improve your reading by reading.

Read the *great* books, for it is in these books that the wisdom of the ages is passed on to posterity. These books give you the chance to "talk" with princes, kings, philosophers, travelers, playwrights, scientists, artists, and novelists. Begin with the books and subjects that interest you, and don't worry about having only narrow interests. Once you begin reading, your interests will widen naturally.

The more good books you read, the easier reading becomes, because with an expanded background, you can more easily and quickly understand the ideas and facts in other books.

But remember, you are fully responsible for initiating the process and habit of reading. Always keep in mind what Mark Twain once said: "The man who *doesn't* read good books has no advantage over the man who *can't* read them."

Edward Gibbon's Way

The great English historian Edward Gibbon (1737–1794), author of *Decline and Fall of the Roman Empire*, made constant use of the great recall technique. This is simply an organized and rather intense use of one's general background. Before starting to read a new book, or before starting to write on any subject, Gibbon would spend hours alone in his study, or he would take a long walk alone to recall everything that he knew about the subject. As he pondered some major idea, he was continually surprised by how many other ideas and fragments of ideas he would dredge up.

Gibbon's system was highly successful. His old ideas were brought to the forefront of his mind, ready for use, and they could act as magnetic centers for new ideas and new information. Great recall promotes concentration.

The Paragraph Way

You can improve your comprehension by stopping at the end of each textbook paragraph to summarize and condense it to a single sentence. To summarize and condense, you must understand the functions of three main types of sentences: the topic or controlling-idea sentence, the supporting sentences, and the concluding sentence. Figure 7.2 shows these three types of sentences in an actual paragraph.

The *topic* sentence announces the topic (or the portion of the topic) to be dealt with in the paragraph. Although the topic sentence may appear anywhere in the paragraph, it is usually first—and for a very good reason. This sentence provides the focus for the writer while writing and for the reader while reading. When you find the topic sentence, be sure to underline it so that it will stand out not only now but also later when you review.

The bulk of an expository paragraph is made up of *supporting* sentences, which help to explain or prove the main topic. These sentences present facts, reasons, examples, definitions, comparisons, contrasts, and other pertinent details. They are most important, because they sell the ideas.

The last sentence of a textbook paragraph is likely to be a *concluding* sentence. It is used to sum up a discussion, to emphasize a point, or to restate all or part of the topic sentence so as to bring the paragraph to a close.

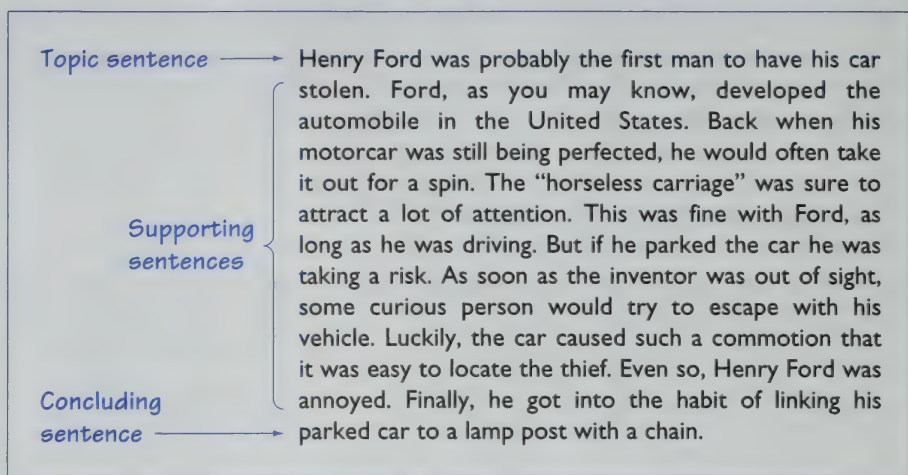


FIGURE 7.2 The Three Elements of an Expository Paragraph

Of course, the paragraphs you'll be reading will be part of some longer piece of writing—a textbook chapter, a section of a chapter, or a newspaper or magazine article. Besides expository paragraphs, in which new information is presented and discussed, these longer writings contain three types of paragraphs: introductory, transitional, and summarizing.

Introductory paragraphs tell you, in advance, such things as (1) the main idea of the chapter or section, (2) the extent or limits of the coverage, (3) how the topic is developed, and (4) the writer's attitude toward the topic. *Transitional* paragraphs are usually short; their sole function is to tie together what you have read so far and what is to come—to set the stage for succeeding paragraphs. *Summarizing* paragraphs are used to restate briefly the main ideas of the chapter or section. The writer may also draw some conclusion from these ideas, based on the evidence in the chapter, or speculate on the basis of that evidence.

All three types should *alert* you: the introductory paragraph of things to come; the transitional paragraph of a new topic; and the summarizing paragraph of main ideas that you should have gotten.

The Page-at-a-Time Way

Thomas Babington Macaulay (1800–1859) was an English statesman, historian, essayist, and poet. His greatest work, *The History of England*, at the

time it was published outsold all other books except the Bible. Macaulay began reading adult books at the age of 3, but after consuming shelf after shelf of books, he suddenly realized that he wasn't gaining much knowledge for all his effort. He understood every word of what he read and seemed to comprehend what the writer was saying, but later he could not summarize the ideas presented or even describe, in general terms, what the writer had written. He described his solution to this problem as follows:

At the foot of every page I read I stopped and obliged myself to give an account of what I had read on that page. At first I had to read it three or four times before I got my mind firmly fixed. But I compelled myself to comply with the plan, until now, after I have read a book through once, I can almost recite it from the beginning to the end.

There's something very basic, honest, and refreshing in the Macaulay way. There are no complicated formulas to follow. You simply stop at the bottom of a page and ask yourself, "In brief, what did the writer say on this page?" This technique will do for you what it did for Lord Macaulay. It will make you concentrate. It will also teach you to think continually while you read. Every time you pause for a brief recall, your memory will be getting stronger.

Daniel Webster's Way

Daniel Webster (1782–1852), American statesman and orator, had his own special technique for building concentration. Before reading a book, he would look at the table of contents, read the preface, and turn some of the pages. Then he would make lists of (1) questions that he expected to be answered in the book, (2) the knowledge he expected to gain from his reading, and (3) where the knowledge would take him. The three lists guided him through the book; his attention and concentration were intense.

The Skimming Way

Both students and business executives report that the workhorse of reading is skimming. Covering many speeds and uses, skimming can range from just fast reading to searching, which could hardly be classified as reading. Whether to use rapid reading or searching—or anything in between—depends on your purpose.

Tailor skimming to your purpose; otherwise you'll waste time. Following are five purposes for skimming and the techniques for each.

Searching for a Needle in a Haystack If you want to find specific information (name, date, word, or phrase) in a textbook or article, searching may be used because it is recognition, not comprehension, that will give you the answer. To ensure that your eyes do not overlook the word or fact you seek, concentrate on it, keeping it in mind as your eyes run over the pages. Concentration will trigger your mind to pick it out of the sea of words. Once you have located the specific word or fact, pause and read the sentence or paragraph surrounding it at a normal rate to make sure, through context, that you have found what you were looking for.

When using the searching technique, if your time is short, resist the temptation to read the whole article. What you may really be doing, subconsciously, is putting off studying. But if you do have time, follow your curiosity and finish the article. It may not help you on the next exam, but the knowledge gained will give you an edge and contribute to your general wisdom.

Looking for Clues When you are seeking specific information but do not know in what words the information may appear, you must use a slower searching method. In this case, you won't be able to anticipate the exact words, so you must be alert for clues, which can appear in various forms.

In this kind of searching, you must infer the answer. For example, after reading an article about Paul Bunyan, a legendary giant lumberjack and folk hero, a student was asked a question about Paul Bunyan's birthplace. The answer was Canada, yet nowhere in the article did the word *Canada* appear. The answer had to be inferred from a sentence that stated that Paul Bunyan was born at the headwaters of the St. Lawrence River. Because the student discovered on a map that the headwaters are in Canada, she could answer the question.

When you are looking for clues, try to guess the form in which the information might appear. When you believe you have found the information you want, go back and read the paragraph to make sure, from context, that it is exactly what you seek.

Getting the Gist Sometimes skimming may be used to get the gist of a book or article. You can use this technique to find out whether a book pertains to the topic you are working on. To get the gist, read both introduction and summary rapidly, as well as paragraphs that have topic sentences indicating that the paragraph contains important data.

This skimming method can help when you have a term paper to write. After having used the computer as an aid, make a list of books that seem related to your topic, get the books and look through them to eliminate

those that are not pertinent and to keep those that are. Obviously, you would waste time and energy if you attempted to read all the books on your list. To get the main idea of each book, look at the table of contents, or select a chapter with a title related to your topic and skim it for its outstanding ideas.

Overviewing a Textbook Chapter An important use of skimming is discussed in Chapter 11: surveying or getting an overview of a textbook chapter before you read it thoroughly. Overviewing may be done to attain various degrees of comprehension. In most cases, this type of skimming calls for understanding captions, headings, subheadings, and portions of paragraphs well enough to locate key concepts in the chapter. Such skimming lets you see the relative importance of each part to the whole.

Skimming to Review Skimming also can be used to review for an examination or for a recitation. After skimming chapters that you have previously read, studied, and noted, for effective study you should pause from time to time and try to recite the main concepts in each chapter or summarize the chapter. After finishing a textbook chapter, always review to understand the chapter as a whole, like a finished jigsaw puzzle.

SUMMARY

How does purpose affect reading?

Purpose determines how much time you'll spend in reading almost anything. For example, looking over a textbook chapter to gain familiarity before listening to a classroom lecture might take no more than half an hour, but reading the same chapter in preparation for a quiz might take three or four hours.

Are eye pauses and subvocalization really necessary during reading?

According to most research, eye pauses and subvocalization are absolutely necessary. The pauses allow your eyes to focus on the words; subvocalization is required for comprehension.

Should I use the faster reading method on textbooks?

No. Textbooks are packed with ideas and facts that cannot be understood or remembered when reading too fast. Faster reading

How can I use intonation silently?

is all right on easier novels that you read for pleasure, as well as for magazines, newspapers, and journals.

Intonation in reading means saying the words silently—but saying them with expression or rhythm, not in a monotone. Just a little practice reading aloud will show you how it works. Reading with intonation requires close attention that will get you to concentrate. The end result will be high comprehension plus speed.

Won't pausing to summarize each paragraph slow me down?

Yes. But what's the sense in moving through a whole chapter without learning or remembering anything? Reading a textbook chapter straight through will yield almost no long-term remembering, so you'll have to go back and read it again anyway. Overall, you'll save time by pausing to summarize—to make sure you understand each paragraph.

How does the paragraph way differ from the page-at-a-time way?

The idea in both systems is to pause, think, and summarize what you have read. Do so paragraph by paragraph when the writing is packed with facts, page by page when the material is written in a more leisurely narrative style.

Why are there various methods of skimming?

The various methods and speed in skimming let you tailor the method to fit the job.

What is the one rule for using skimming?

Use skimming as a tool. Determine what the main purpose of your assignment is, and then judge whether skimming can help you achieve your purpose.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Edward Gibbon learned new ideas by letting his old ones act as _____.

magnets examples summaries

2. A summary paragraph or sentence usually restates _____.
references information transitions

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-------------------------------|---|
| _____ 1. Eye movement | a. Processes words one at a time |
| _____ 2. Fixation | b. Blurs words on a page |
| _____ 3. Subvocalization | c. Always accompanies reading |
| _____ 4. The mind | d. Should not be applied to textbooks |
| _____ 5. Faster reading | e. Allows the eyes to focus |
| _____ 6. Background knowledge | f. Helps you to understand the chapter as a whole |
| _____ 7. Overviewing | g. Most crucial prerequisite for learning |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Your eyes can see only about ten printed letters at one time.
_____ 2. Your eyes can see clearly only when they are not moving.
_____ 3. A good vocabulary is one of the best tools for effective reading.
_____ 4. Transitional paragraphs help you to follow the writer's train of thought.
_____ 5. Supporting sentences are usually placed in the middle of a paragraph.
_____ 6. You will read more effectively if you read great books.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Reading for understanding does not require
a. speed.
b. fixations.
c. thinking.
d. subvocalization.
2. Words acquire an extra dimension when reading is done
a. Daniel Webster's way.
b. the skimming way.
c. the intonation way.
d. the vocabulary way.

Short answer. Supply a brief answer for each of the following questions.

1. Why is vocalization a necessary part of reading for comprehension?
2. Why do you think the use of *intonation* helps to improve both speed and comprehension in reading?
3. Why do you think Thomas Babington Macaulay's "page-at-a-time way" improves your memory of what you've read?

THE WORD HISTORY SYSTEM

bedlam bed'-lam *n.* A place or situation of noisy uproar and confusion.

Bedlam: *really, a madhouse*



In 1247 the priory of St. Mary of Bethlehem was founded in London. In the early fifteenth century it came to be used as a hospital for lunatics. Familiarly known as *Bethlehem*, the name of the asylum was contracted in popular usage to *Bethlem*, *Bedlem*, or *Bedlam*. The name came to be applied to any lunatic asylum, and consequently, in our own day, *bedlam* is used to signify any scene of uproar or confusion that is suggestive of a madhouse.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Insult: a *callous* or *contemptuous* statement or action; a verbal attack upon another person.

—dictionary definition

- | | | | |
|-----------------------------------|-------------|---------------|----------|
| 1. <i>callous</i> . . . statement | thoughtless | nonfeeling | careless |
| 2. <i>contemptuous</i> statement | disdainful | inconsiderate | impolite |

The most important single *ingredient* in the formula of success is knowing how to get along with people.

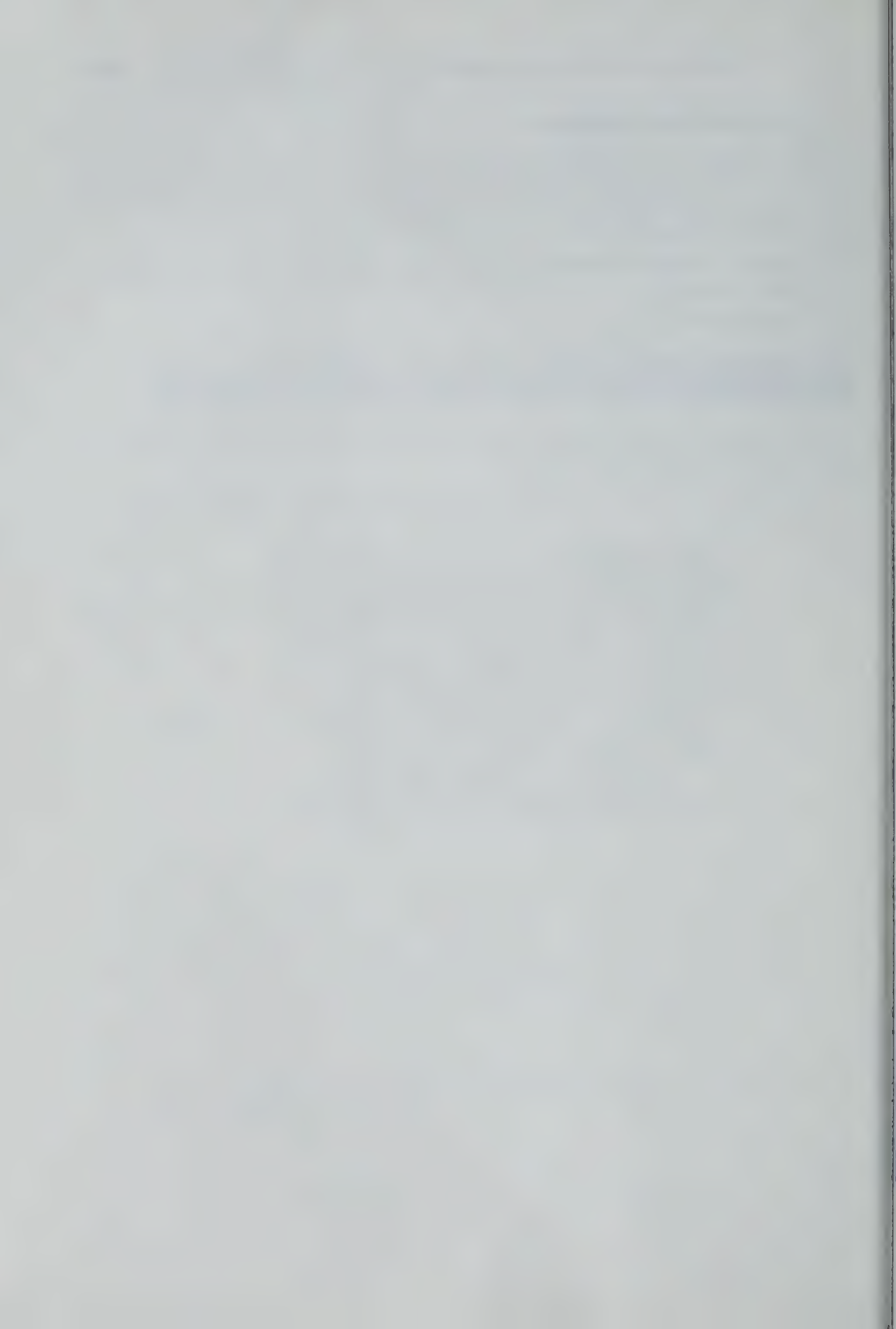
—Theodore Roosevelt (1858–1919), twenty-sixth president of the United States

- | | | | |
|--------------------------------------|-----------|-------------|-----------|
| 3. important . . . <i>ingredient</i> | guideline | requirement | component |
|--------------------------------------|-----------|-------------|-----------|

Too often it's not the most creative guys or the smartest. Instead, it's the ones who are best at playing politics and soft-soaping their bosses. Boards don't like tough, *abrasive* guys.

—Carl Icahn (1936–), CEO, Trans World Airlines

- | | | | |
|-------------------------|--------|------------|--------|
| 4. <i>abrasive</i> guys | strict | irritating | rugged |
|-------------------------|--------|------------|--------|



UNDERSTANDING AND USING KEY CONCEPTS

Ideas won't keep; something must be done about them.

—ALFRED NORTH WHITEHEAD (1861–1947), ENGLISH
MATHEMATICIAN AND PHILOSOPHER

The “something” in Whitehead’s epigram is *reflection*, because only through reflection can we truly and permanently weave ideas into the vital tissues of our memory. To aid you in mastering four key concepts, this chapter deals with:

- The power of questions
- Gaining mastery and wisdom through reflection
- Recognizing and using signal words
- Recognizing and using organizational patterns

UNDERSTANDING AND USING KEY CONCEPTS

The Power of Questions

Questions Help You
Become Your Own Teacher

Questions Promote
Alertness

Questions Help You
Master Reading and
Note Taking

Gaining Mastery and Wisdom Through Reflection

Professor Bethe's
View of Reflection

Professor Whitehead's
View of Reflection

Arthur Schopenhauer's
View of Reflection

Recognizing and Using Signal Words

Table of
Signal Words

Recognizing and Using Organiza- tional Patterns

What a Reader
Should Do

What a Note Taker
Should Do

Nine Organizational Patterns

Time or Chronological

Process

Place or Spatial

Increasing Importance

Decreasing Importance

Cause and Effect

Compare or Contrast

Inductive

Deductive

The heart of the textbook reading system and the note-taking system is the formulation of questions.

THE POWER OF QUESTIONS

As a starting point, we will explore the power of questions through an episode in the life of Eddie Rickenbacker, World War I flying ace and later chairman of Eastern Airlines.

Questions Help You Become Your Own Teacher

Rickenbacker left school at the age of twelve to help support his widowed mother. Later, realizing the need for further education, he took a correspondence course in mechanical engineering. Here's part of his story:

The first lesson, I do not mind admitting, nearly finished my correspondence-school education before it began. It was tough. . . . As there was no teacher of whom I could ask a question, I had to work out the answers myself. Once I reached the answer through my own individual reasoning, my understanding was permanent and unforgettable.¹

I can picture young Eddie Rickenbacker with paper and book spread out on a kitchen table, struggling to gain meaning from a paragraph. Doubts began to mount. Plain grit wasn't enough. He felt overwhelmed. Then, in desperation, he probably said to himself, "All right, Eddie, try it once more: What's this fellow trying to tell me?"

Right then, he created a miniature miracle. How? He asked a question! Now, with a question ringing in his ears, he focused on hearing an answer, and he heard it and understood it. Armed with this questioning technique, he became his own teacher. Previously, his eyes touched the words on the page and, in touching, expected that meaning would somehow, like a jack-in-the-box, pop up. But it didn't (and it doesn't).

We shouldn't be surprised that questions are packed with so much power. Human beings have known this for more than 2,400 years. Socrates (469–399 B.C.), the greatest of the Greek philosophers, developed what is known as the Socratic method, *the questioning method*. By a series of carefully directed questions, Socrates would lead another person, through his own step-by-step answers, to arrive at the understanding or conclusion himself.

¹Edward V. Rickenbacker, *Rickenbacker* (Englewood Cliffs, NJ: Prentice-Hall, 1967), pp. 31–32.

What is it that makes a question so powerful? Maybe, as the psychologists say, questions promote concentration. If true, what a sure and easy way to gain concentration with a technique that is available to all of us! As most of us have found out, concentration is a slippery quality.

The paradox and the slippery quality of concentration are best portrayed and explained by psychologist William James, who said that trying to seize concentration directly is “like seizing a spinning top to catch its motion, or trying to turn up the gas light quickly enough to see how the darkness looks.”²

Questions Promote Alertness

Questions seem to energize both body and mind. The hormone adrenaline, when released into the bloodstream, shifts the body into a state of alertness and readiness. The following story illustrates the similar effect of questions:

Fishermen put fish into a floating tank to keep them alive until they reached port several days later. But, even so, the fish were often stale. Why? The fish just floated in one spot, gulping water and occasionally rippling a fin. One captain, however, brought back beautiful fish. They were fresh and lively. When he retired, he revealed his secret: “For every thousand live herrings, I put into the tank one big, vicious catfish. Yes, the catfish eat a few herrings, but they keep the rest moving. They keep them lively, and the herrings come back in beautiful condition.”

So questions, like catfish, keep your mind from becoming stale and flabby when you read. Questions are the vital sparks that ignite the fluid powers of concentration.

Questions Help You Master Reading and Note Taking

The question technique can be used to master the two most important academic functions that convert information into knowledge. These two functions are reading textbook assignments and understanding the notes taken of a lecture. They are each the subject of a separate chapter, but, for a glimpse of what’s to come, here are two miniature examples: questions in the margins of textbooks and questions in the margins of lecture notes (see Figures 8.1 and 8.2).

²William James, *Psychology* (New York: Henry Holt, 1893), p. 161.

WRITING GOOD PAPERS IN COLLEGE

What two
aspects lead
to success?

The techniques of writing a good paper are easy to follow. You should remember two important aspects that lead to success. First, start work early on the paper. Second, if you have a choice, choose a subject that you are interested in or that you can develop an interest in.

What three
elements
might make
up a paper?

Much of your work in college involves absorbing knowledge; when it comes to writing papers, you have the opportunity to put down on paper what you've learned about a subject, and perhaps your opinions and conclusions on the subject.

What's the
key in choosing
a topic? If not
sure of a topic,
do what?

Writing is an important form of communication. To communicate well you must have something you really want to say. So if you have a choice of topics, choose one that intrigues you. If it isn't one that everyone else is writing on, all the better. If you're not sure about your choice of topic, do a little preliminary research to see what's involved in several topics before you make a final decision. Remember the caution about allowing yourself enough time? Here's where it comes into play. Take enough time to choose a topic carefully.

FIGURE 8.1 Example of Writing Questions in the Margins of Textbooks

There is no better way to guarantee academic success than by using the question-asking system to promote laserlike concentration.

GAINING MASTERY AND WISDOM THROUGH REFLECTION

Questions provide understanding of information. Recitation (see Chapter 5) strengthens the remembering of information. *Reflection* ensures mastery of information, but, best of all, it converts information into lasting learning (and perhaps wisdom).

Reflection means investigating not only the ideas and facts but also their implications. It means never being satisfied but instead asking questions, noting reservations, thinking critically. Most of all, reflective thinking adds quality and creativity to our intellectual lives.

<p>Who purchased Alaska? When? Cost? Rough dimensions of mainland? How long is the Yukon River? Name kinds of minerals?</p> <p>How are the forests?</p> <p>Two most numerous fish?</p> <p>Name several kinds of fur?</p> <p>What's the highest mt. in No. America? When admitted as state?</p> <p>Who designed the state flag?</p>	<p>Sept. 10, 2001 (Mon.) – History 101 – Prof. A. Newhall</p> <p>A. Some facts about Alaska</p> <ol style="list-style-type: none"> 1. William H. Seward, Sec. of State – fr. Russia in 1867 – \$7,200,000. 2. Size – mainland: length = 1,500 mi. – width = 1,200 mi. 3. Yukon River – 1,979 mi. long 4. Minerals – oil, gold, silver, coal, chrome, iron, etc. 5. Forests – commercial timber = 85 billion board feet 6. Fish – world's richest in salmon and halibut 7. Furs – seal, mink, otter, beaver, fox, etc. 8. Mt. McKinley – 20,320 ft. – highest in No. America 9. Statehood – Jan. 3, 1959 – 49th State 10. State flag – designed by 13-year-old Benjamin Benson
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FIGURE 8.2 Example of the Cornell Note-Taking System

Professor Hans Bethe, Cornell University's famous nuclear physicist and Nobel Prize winner, talked about reflection as used by a scientist:

To become a good scientist one must live with the problem he's working on. The problem must follow the scientist wherever he goes. You can't be a good scientist working only eight hours a day. Science must be the consuming interest of your life. You must want to know. Nothing matters more than finding the answer to the question or the problem you are engaged in.³

Professor Bethe went on to say that students who go only as far as their textbooks and lectures take them can become proficient, but never creative. Creativity comes only with reflection. That is, seeing new material in the

³Interview with Professor Hans Bethe, May 19, 1960.

light of what you already know is the only road to original ideas, for having an idea is nothing more than discovering a relationship not seen before. And it is impossible to have ideas without reflecting.

Alfred North Whitehead, famous British philosopher and mathematician, strongly advocated reflection. He, too, spoke about the knowledge that grows out of throwing ideas “into fresh combinations.” He viewed reflection as taking what one already knows and projecting one’s thought beyond familiar experience—considering new knowledge and ideas in the light of old, and the old in the light of the new.

The famous German philosopher Arthur Schopenhauer voiced exceptionally strong views on the importance of reflection.

A library may be very large, but if it is in disorder, it is not so useful as one that is small but well arranged. In the same way, a man may have a great mass of knowledge, but if he has not worked it up by thinking it over for himself, it has much less value than a far smaller amount which he has thoroughly pondered. For it is only when a man looks at his knowledge from all sides, and combines the things he knows by comparing truth with truth, that he obtains a complete hold over it and gets it into his power.

Reflections should not be left vague. Pursue the problem until ideas take definite shape. If you need more information, an encyclopedia or a standard book on the subject will often give you what you need to bring fuzzy ideas into focus.⁴

Reflection is a skill you can take with you wherever you go and make use of in spare moments. You can reflect while walking from one building to another, standing in line, waiting for a friend, or riding a bus. People who have made great discoveries have reported that some of their best insights came in unlikely places and at odd times.

The subconscious plays an important role in creative thinking and discovery. We have all had an exciting idea or even the solution to a problem suddenly flash upon us when we weren’t consciously thinking about it. The subconscious continues to work on concepts introduced deep into the mind through reflection.

To jump-start the process of reflection, ask yourself questions. For example, What’s the significance of these facts and ideas? What principle are they based on? How can I apply them to what I already know? How do they fit? What’s beyond these facts and principles?

What distinguishes learning through reflection from regular learning is your mental attitude. Knowledge gained through reflection will still be with you long after you have taken your final examinations.

⁴*Essays of Arthur Schopenhauer*, selected and translated by T. Bailey Saunders (New York: A. L. Burt, 1892), p. 321.

The use of questions can make you an analytical person. And the continual use of reflection can hasten your becoming a person of deep understanding. To be communicated to others, however, the outcomes of these techniques need to be couched in *signal words* and supported by *organizational patterns*. Since we think with words, the mastery of the two literary devices below will make you a better thinker, speaker, and writer.

RECOGNIZING AND USING SIGNAL WORDS

Words are magical messengers that can transmit ethereal thoughts from one mind to another. Furthermore, some words, which we call signal words, can indicate the direction or place of one's thoughts.

If you, as a note taker or textbook reader, know and recognize these signal words and phrases, you will be able to understand the lecturer's and writer's thoughts more rapidly and accurately. In addition, as a bonus, you can become a better writer and speaker.

In Table 8.1 you will find the most common signal words and phrases and some suggestions on how to react to them.

RECOGNIZING AND USING ORGANIZATIONAL PATTERNS

Organizational patterns help to organize a person's thoughts. This organization helps both the writer to write and the reader or listener to gain in understanding. Here are some specific tips for reading and listening.

What a Reader Should Do

One way to keep your mind on your reading is to recognize and keep yourself aware of the organizational pattern that the author is using. Then you will think with the author as you read. For example, suppose you recognize that a paragraph is organized according to a chronological pattern. Then you would say to yourself, "Yes, I see what she's doing. She's describing the major events of the Great Depression as they happened, year by year." As you focused on the pattern, your mind would stay on your reading and you would be thinking about it.

TABLE 8.1 Signal Words and Phrases

Categories and Examples	When you come across these words, immediately think . . .
Example Words specifically to illustrate for example for instance that is	“Here comes an example. Must be double-checking to make sure I understood the point just made.”
Cause-and-Effect Words consequently therefore as a result if . . . then accordingly thus, so hence	“Here’s an effect word. Better check back when I have a chance to make sure I can find the cause now that I know what the effect is.”
Enumeration Words the four steps . . . first, second, third next, finally	“That’s a lot of steps. I’d better be sure I’m keeping track of all of them and getting them in the right order.”
Addition Words furthermore as well as along with in addition moreover also not only . . . but also	“Seems there’s always something else to be added. Must be worth remembering.”
Contrast Words on the other hand in contrast conversely although however, despite whereas	“Here comes the other side of the coin. Let’s see how it differs from what’s been said already.”
Comparison Words likewise similarly comparatively identical	“Lots of similar things, it seems.”
Swivel Words however nevertheless yet but still	“Looks like there’s going to be a little bit of doubt or ‘give back’ on the point just made. Better pay attention to this qualifying remark.”

(continued)

TABLE 8.1 Continued

Categories and Examples	When you come across these words, immediately think . . .
Concession Words to be sure indeed though, although granted of course	"Okay! Here comes an argument or two from the opposing point of view."
Emphasis Words more important above all remember in other words finally	"Looks as though what's coming up is going to be important."
Repeat Words in other words it simply means that is briefly in essence as we've seen	"Here comes another explanation. Maybe I'll understand this one a little better."
Time Words before, after formerly, soon subsequently prior, during meanwhile	"Hmm! A time relationship is being established. Let's see: What came first, what came last, and what came in-between?"
Place Words above below beyond adjacent to	"Okay! I'll put these ideas and facts not only in their proper places, but also in their proper relationship."
Summary Words for these reasons on the whole in conclusion in a nutshell to sum up in short finally	"Good. Now I'll get a simple wrap-up of the points that have been made. It's almost sure to be full of key ideas."
Test Words (lectures) This is important. Remember this. You'll see this again. Here's a pitfall.	"Sounds like a potential test item. Better be sure to pay close attention to it."

What a Note Taker Should Do

During a lecture, it is difficult to perceive a pattern, but if you do, then adjust your note taking to follow it. However, if you recognize no pattern during the note-taking session, read your notes back in your room. Now that you have the full lecture before you, try to see whether you can perceive a pattern. If you can, your understanding and remembering of the lecture will be greatly enhanced.

Common Patterns

Here are brief descriptions of the most commonly used organizational patterns. Look for them when taking notes and reading your texts.

Time or Chronological Pattern Events are presented in the order in which they happened. This pattern can be recognized quickly from the author's or lecturer's use of dates and such phrases as *in previous years*, *the next day*, and *two years later*, which denote the passage of time.

Process Pattern Steps or events are presented in an orderly sequence that leads to a desired situation or product. A recipe and the instructions for assembling a bicycle provide examples of process patterns. They often include words such as *first*, *after this*, *then*, *next*, and *finally*. You'll often encounter this pattern in computer courses and the sciences, where the steps in a process are described in the order in which they must occur to put something together, instruct the computer, or blend ingredients.

Place or Spatial Pattern Items are presented or discussed on the basis of their locations or their arrangement relative to each other. For example, an author might use this pattern to describe the geographical features of the United States from the West Coast to the East Coast. In such a case, this pattern is often called the *geographical pattern*. It is also called the *topical pattern* when it is used to describe the organization of a corporation along the lines of purchasing, manufacturing, sales, and so forth. The progression from item to item is usually orderly and easy to follow: from left to right, from high to low, from north to south, and so on.

Increasing-Importance Pattern In this pattern, the most important or most dramatic item in a series is placed at the end. Each succeeding item is

more important than the previous one, so a crescendo effect is created. Thus, this pattern is also called the *climactic-order pattern*.

Decreasing-Importance Pattern In this pattern, the most important or most dramatic item in a series is placed at the very beginning. Such an organization grabs the reader's interest immediately, so there is a good chance the reader will stay with the writer or speaker all the way through.

Cause-and-Effect Pattern This exceedingly important general pattern has such variations as the *problem-cause-solution pattern* and the *problem-effect-solution pattern*. Whatever the combination, you should be able to identify the various parts of the pattern—the problem, cause, effects, and solution. Once you hear the problem, you can generally start to anticipate the cause and the solution.

Compare or Contrast Pattern Writers and speakers *compare* things, events, or people when they emphasize similarities and *contrast* them when they emphasize differences. Individual characteristics may be compared or contrasted one at a time, or lists of characteristics may be discussed as a group. In either case, the pattern can be recognized from the various similarities or differences and from the use of words such as *similarly*, *likewise*, *conversely*, and *on the other hand*.

Inductive Pattern The speaker identifies a number of incidents and draws a conclusion from them. The speaker's main point will be something like this: "So, on the basis of all these facts, we come to this overriding principle, which is so-and-so."

Deductive Pattern This pattern is the reverse of the inductive pattern. Here, the principle or general statement is given first and then the events or proofs are enumerated.

Recognizing these patterns will help you not only in note taking and reading but also in your own writing of reports and research papers.

SUMMARY

What makes the question such a powerful learning device?

Requires us to think, which enables learning.

The power of a question lies in its natural and inherent quality to make us *think*, and the thinking that goes into formulating an answer to a question is usually focused thinking, which, in turn, enables learning.

How is wisdom gained through reflection?

after his ideas; add own creative thinking

How do signal words aid comprehension and also speed reading?

Traffic signs look ahead

How does the recognition of organizational patterns help us to comprehend better?

When you *reflect*—that is, look at the author's ideas to discover new relationships and new angles aided by the knowledge you already have—you add to your own creative thinking.

Signal words are the verbal equivalents of traffic signs. Both tell you what to expect ahead, thus giving you time to anticipate and adjust.

Once you identify the organizational pattern used by a speaker or writer, you'll be on familiar ground. Then all you need to do is follow along that route.

Once identified, follow along that route

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the words or phrases listed below each sentence.

- Psychologists say questions promote Concentration.
creativity training in decision making concentration
- During a lecture, if you do not detect the speaker's organizational pattern, you should keep writing, then try to discover the pattern later.
stop writing and just listen intently keep writing, then try to discover the pattern later
stop writing, but later find out from other students

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-------------------------------------|--|
| <u>c</u> 1. Questions | a/ Depend on the arrangement of topics and ideas |
| <u>e</u> 2. Concentration | b. Thinking seriously about a fact or idea |
| <u>b</u> 3. Cognitive processing | c. Gaining basic understanding |
| <u>f</u> 4. Reflection | d. Writers use to guide the reader |
| <u>d</u> 5. Signal words | e. Gaining undivided attention |
| <u>a</u> 6. Organizational patterns | f. Seeing relationship among ideas |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- F 1. Reflection is a silent way of reciting.
- F 2. The main function of a question is to make a deeper impression in your memory.
- T 3. Concentration is as difficult as seizing a spinning top.
- F 4. A single key word in the margin of a textbook can serve the purpose as effectively as a question.
- T 5. According to Professor Bethe, creativity comes only with reflection.
- F 6. Signal words actually help the writer more than the reader.
- F 7. Selective underlining of the main ideas in a textbook serves the same purpose as writing questions in the margin.
- F 8. According to Schopenhauer, reflection can leave your memorized knowledge in disarray.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. The best way to formulate a question about a paragraph is to convert into a question the
 - a. paragraph's caption.
 - b. topic sentence.
 - c. summarizing sentence.
 - d. paragraph's main idea.
2. In a lecture or text, the words "for these reasons" most probably indicate a forthcoming
 - a. summarizing statement.
 - b. cause-and-effect explanation.
 - c. comparison.
 - d. concession.
3. In a lecture or text, the words "first, next, after this" most probably indicate a(n)
 - a. chronological pattern.
 - b. enumeration pattern.
 - c. inductive pattern.
 - d. process pattern.

4. If you hear, "I've come to you with a solution," most probably the speaker will be using a(n)
 - a. spatial pattern.
 - b. increasing-importance pattern.
 - ☒ c. cause-and-effect pattern.
 - d. inductive pattern.
5. A speaker is usually guided in his or her choice of pattern by the
 - ☒ a. nature of the material.
 - b. objective to be achieved.
 - c. type of audience.
 - d. size of audience.

Short answer. Supply a brief answer for each of the following items.

1. Why do questions promote better comprehension?
2. Professor Bethe said, "Creativity comes only with reflection." Why is creativity so dependent on reflection?
3. How does reflection bring about better remembering?
4. How do signal words help you in both textbook reading and lecture note taking?
5. Discuss why you think the recognition of an organizational pattern enhances understanding.

THE WORD HISTORY SYSTEM

bonfire bon'-fire *n.* A large outdoor fire.

Bonfire: *a fire of bones*



In the Middle Ages, funeral pyres for human bodies were a necessity in emergencies of war or pestilence. *Bonefires* (fires of bone), they were called. Later, when the custom of burning heretics at the stake became common, *bonefires* was the name applied to the pyres of these victims. The same term was used to designate the burning of symbols of heresy or other proscribed articles. Later, its meaning was extended to open-air fires for public celebrations or sports—but by this time in the less gruesome spelling *bonfire*, which today is a comparatively harmless word despite its grim history.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Failure! There is no such word in all the bright *lexicon* of speech, unless you yourself have written it there! There is no such thing as failure except to those who accept and believe in failure.

—Orison Swett Marden (1906–1975), American lawyer

1. *lexicon* of speech expressions idioms dictionary

In the depth of winter, I finally learned that within me there lay an *invincible* summer.

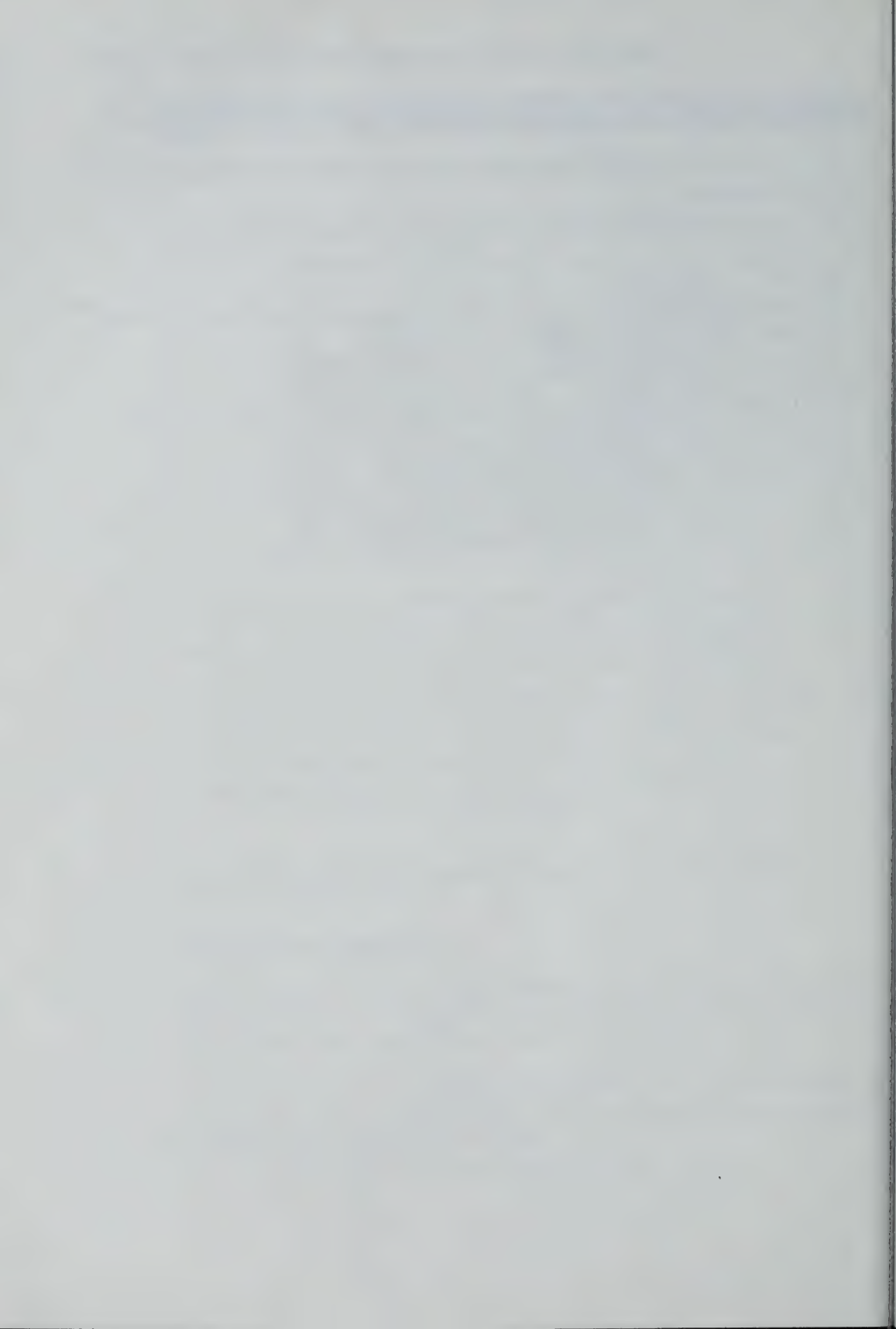
—Albert Camus (1913–1960), French novelist, essayist, and dramatist

2. an *invincible* summer fiery hot unbeatable intense

The gambling known as business looks with *austere* disfavor upon the business known as gambling.

—Ambrose Bierce (1842–1914), American author

3. with *austere* disfavor stern enormous particular



LISTENING TO TAKE GOOD NOTES

Learn how to listen and you will prosper even from those who talk badly.

—PLUTARCH (A.D. 46–120), GREEK BIOGRAPHER AND PHILOSOPHER

A recent survey revealed how much time college students spend in four types of communication:

Listening	53%
Reading	17%
Speaking	16%
Writing	14%

Now hear this! You can't learn if you don't listen. With dozens of noises and thoughts vying for your attention, acquiring good listening skills takes hard work and practice, but the effort is worth making, and the rewards are long lasting. This chapter discusses:

- Your listening habits
- Comprehensive listening
- Triple-A listening
- Ten keys to effective listening
- Listening for shifts in intonation

LISTENING TO TAKE GOOD NOTES

**Your Listening
Habits**

Ten-Item Test

**Comprehensive
Listening**

Ask Questions
to Clarify

**Triple-A
Listening**

Maintain a Positive
Attitude

Strive to
Pay Attention

Cultivate a Capacity
for Adjustment

**Ten Keys to
Effective
Listening**

**Listen for
Shifts in
Intonation**

Volume
Pauses
Cadence

Almost all the information you are responsible for in a college-level course comes from two sources: lectures and textbooks. If you can master the information from these two sources, the chances of academic success are great. WHAT
2
SOURCES?
WHY?

YOUR LISTENING HABITS

This chapter focuses on procedures to help you master listening. Your goal is to get the lecturer's message. The message, however, is not always obvious, so it's necessary to listen attentively to capture on paper a series of key ideas and supporting details that you can take back to your room and piece together to achieve understanding. But first, where do you stand as a listener? Figure 9.1 presents a short quiz that will let you know. Goal?

COMPREHENSIVE LISTENING

The following quotation illustrates the inherent difficulty of oral communication:

I know you believe that you understand
What you think I said, but I am not sure
That you realize that what you heard is not what I meant.

For communication to occur, both the speaker and the listener must act responsibly. Act How? The speaker's responsibility is to make points clearly. The listener's responsibility is to understand what the speaker says. Comprehensive listening occurs when the listener encourages the speaker to fully articulate his or her message, thus enabling the speaker to be more clear. If a speaker's message is not clear and the listener asks a clarifying question, both the speaker and the listener benefit. The speaker is encouraged and gratified to know that the audience is interested. The listener can concentrate on what the speaker has to say and feel good about raising a question that was probably troubling less bold members of the audience.

A professor at the University of Virginia conducted a survey and found that 94 percent of her students had failed to understand something in at least one class lecture during the semester. Seventy percent of the students had not asked clarifying questions even though they knew they could. When she asked them why they had remained silent, they answered with

How often do you find yourself engaging in these ten bad habits of listening?
Check the appropriate columns.

Frequency

How often do you ...	Almost always	Usually	Sometimes	Seldom	Almost never	Score
Decide that the topic is boring?				<input checked="" type="checkbox"/>		
Criticize the speaker?					<input checked="" type="checkbox"/>	
Overreact by disagreeing?					<input checked="" type="checkbox"/>	
Listen only for bare facts?				<input checked="" type="checkbox"/>		
Outline everything?			<input checked="" type="checkbox"/>			
Fake attention?			<input checked="" type="checkbox"/>			
Yield to distractions?				<input checked="" type="checkbox"/>		
Avoid listening to tough technical information?				<input checked="" type="checkbox"/>		
Let emotion-laden words arouse personal antagonism?				<input checked="" type="checkbox"/>		
Waste thought speed by daydreaming?				<input checked="" type="checkbox"/>		
Total score						

Tally your score as follows: 48

Almost always 2 ¹/₂

Usually 4 ⁶/₁₀

Sometimes 6

Seldom 8

Almost never 10

Interpret your score as follows:

Below 70 ~~47~~ **Need training in listening**

70 to 90 **You listen well**

Above 90 **Extraordinarily good listener**

FIGURE 9.1 Listening Habits

Adapted from Ralph G. Nichols and Thomas R. Lewis, *Listening and Speaking*, p. 166. Originally published by Wm. C. Brown Group, 1954. Reprinted by permission of the authors.

such statements as, "I was afraid I'd look stupid," "I didn't want to make myself conspicuous," "I was too proud to ask," "I was too confused to know what question to ask." Look How?

The way to dispel the fear of asking is to remember that the only dumb question is the one that is never asked. The way to dispel confusion is to acknowledge it by saying, "I'm confused about the last point you made" or "I'm confused about how the example pertains to your main point." In this situation, as in most, honesty is the best policy.

Sometimes the lecturer, to create a dialogue or to see whether the class is understanding the material, will ask you a question. When this happens, a good and fair response is to begin by paraphrasing or even repeating the question. Doing this keeps you on the right track, gives you a chance to warm up your thinking on the subject, and buys you some time to compose a reasonably good opening statement and gather your thoughts. Ask? Response?

Triple-A listening

1. attitude

2. attention

3. adjustment

TRIPLE-A LISTENING

Listening is the first step in note taking. Being a good listener means being an active listener. But listening is not the same as hearing. It isn't simply a matter of acting as a human microphone and picking up the sound of the lecturer's voice. Listening is a conscious activity based on three basic skills: attitude, attention, and adjustment. These skills are known collectively as *triple-A listening*.

pos. att = open-mindedness

Maintain a Positive Attitude

A positive attitude sets the stage for open-mindedness. As businessman and author Kevin J. Murphy says in *Effective Listening*, "Minds are like parachutes; they only function when open."¹

Although you can take many steps to improve your listening, the prerequisite to effective listening is a positive mental attitude. You must walk into the classroom convinced that the lecturer has something useful to say. Doubt? If you have any doubts, take a moment to think about the kind of preparation that goes into a typical lecture. The lecturer had to do the searching, reading, selecting, discarding, and organizing of information from dozens of

¹Kevin J. Murphy, *Effective Listening: Hearing What People Say and Making It Work for You* (New York: Bantam Books, 1987), p. 28.

books and other sources—a task that can take hundreds of hours. You can reap the benefits of all that effort in a single lecture.

Maintain that positive attitude even if the lecturer makes statements you don't agree with; don't automatically decide he or she is wrong. If you hear something that rubs you the wrong way, write it down, but keep on listening. Voice your opinion by asking intelligent, clarifying questions after the lecture. In the meantime, don't let reactive interference prevent you from recalling the speaker's key points. All in all, keeping a positive attitude means giving the lecturer the benefit of the doubt.

Disagree?

Attention → concentration → focus → learning
Strive to Pay Attention

Attention is the sure path that will lead you into the wonderful state of concentration. Without concentration there is no focus, and without focus there is almost no learning.

Concentration does not mean thinking only one thought. Concentration means holding a central issue in mind while you accept or reject ideas that are related to that issue. In the words of F. Scott Fitzgerald (1896–1940), author of the novel *The Great Gatsby*, “The test of a first-rate intelligence is the ability to hold two opposed ideas in mind at the same time.” If you pay attention and concentrate, you will become an active listener able to synthesize new information with facts and ideas you've already known.

Att. & Con?

A good way to begin concentrating is to anticipate the lecture. Before class, look over your notes from the last lecture, and take a minute to speculate about what your instructor is going to talk about today. If the lectures follow your textbook, peek ahead to see what's coming. Once the lecture starts, let your mind dart ahead (during pauses) to anticipate what's coming next. You'll be alert, engrossed in the material, and concentrating 100 percent. Another way to start the process of concentration is to look at the course syllabus.

You cannot attain concentration by concentrating on concentration. Your attention must focus on the lecture. Deep cognition, or deep thinking, is vital. When you hear a lecture, the words enter your short-term memory, where they have to be swiftly processed into ideas. Active listening sets that process in motion. If your instructor's words are not processed through active listening that results from attention and concentration, they will be dumped from short-term memory and will be gone forever. If you process the words into ideas, in a flash the ideas will be stored in your long-term memory.

words → ideas → stored long term

Research has shown that an average student remembers about 50 percent of a ten-minute lecture when tested immediately and 25 percent of the same lecture when tested forty-eight hours later. These poor results occur when students are unable to package the lecturer's ideas into easily remembered units. *50% length?*

Cultivate a Capacity for Adjustment

Although some speakers clearly indicate what they intend to cover in their lectures, you need to be flexible enough to follow a lecture regardless of the direction it may take. Sometimes a speaker says, "This event had three important results" and then goes on to discuss four or five. Other times a question from the audience suddenly shifts the speaker's focus. In such cases, you can't simply tune out the parts of the lecture that don't fit with your expectations. You have to be able to "roll with the punches." That's why adjustment is such an important component of active listening. If, however, you are thoroughly lost, or if the speaker's message is not coming across and you need to ask a clarifying question, do so.

Clarify

TEN KEYS TO EFFECTIVE LISTENING

Don't compartmentalize. Use good listening skills both inside and outside the classroom.

Of the many skills a person needs to learn in this complex world, listening is just about the easiest to acquire. All you need to do is recognize the habits of a poor listener as well as the techniques used by a good listener. Then, knowing the good techniques, apply them without exception in all your daily activities.

You can make a fresh and immediate start today by referring to Figure 9.2, which lists the ten most important keys to effective listening. Then, see how the following pages amplify these skills.

Finding Areas of Interest

In the classroom, you're a captive audience for the duration of the lecture. This time will be totally wasted if you decide not to listen. Some students

Keys to Effective Listening	The Poor Listener	The Good Listener
1. Find areas of interest	Tunes out dry topics.	Seizes opportunities: "What's in it for me?"
2. Judge content, not delivery	Tunes out if delivery is poor.	Judges content, skips over delivery errors.
3. Hold your fire	Tends to enter into argument.	Doesn't judge until comprehension is complete.
4. Listen for ideas	Listens for facts.	Listens for central themes.
5. Be a flexible note taker	Is busy with form, misses content.	Adjusts to topic and organizational pattern.
6. Work at listening	Shows no energy output, fakes attention.	Works hard; exhibits alertness.
7. Resist distractions	Is distracted easily.	Fights or avoids distractions; tolerates bad habits in others; knows how to concentrate.
8. Exercise your mind	Resists difficult expository material; seeks light, recreational material.	Uses heavier material as exercise for the mind.
9. Keep your mind open	Reacts to emotional words.	Interprets emotional words; does not get hung up on them.
10. Thought is faster than speech; use it	Tends to daydream with slow speakers.	Challenges, anticipates, mentally summarizes, weighs the evidence, listens between the lines to tone of voice.

FIGURE 9.2 Ten Keys to Effective Listening

Source: Reprinted by permission of Unisys Corporation.

try to use a lecture period to read their textbooks, but doing so is a waste of time because they will be unable to concentrate enough on either the book or the speaker. It is best to listen intently, take notes vigorously, and show interest by your facial expression. These outward manifestations of interest will create genuine internal interest.

Don't read while lecture is going on
listen
take notes
show interest

Outside the Classroom In personal listening, you have a chance to redirect an uninteresting topic. Listen intently, sincerely, and politely, but at appropriate moments ask questions about aspects of the topic that interest you most.

*Listener: intently, sincerely, politely
ask "???" @ right moments*

Judging Content, Not Delivery

Listeners are sometimes terribly rude or downright cruel when a lecturer's delivery fails to measure up to some preconceived standard. Try to approach each lecture with a humane attitude. Block out negative thoughts, and determine to concentrate totally on what's being said. If you do, you'll emerge from the lecture with a positive self-image. You will also learn something.

attitude?

Outside the Classroom In personal listening, your kind smile and relaxed attitude can help put the speaker at ease. Don't make the speaker uncomfortable by being aloof or impatient.

Holding Your Fire

In college you're bound to hear ideas that are different from or even contrary to those you hold. When this happens, your knee-jerk reaction may be to speak up immediately to defend your position. If you decide to attack, you will be too preoccupied to listen attentively to the rest of the lecture. You will be assessing the damage that is being done to your pet ideas, devising an embarrassing question to ask the lecturer, and fantasizing about the results once the lecturer has been "shown up." With such thoughts, it's no wonder that the rest of the lecture gets tuned out.

If you attack?

You must learn not to get overly excited about a lecturer's point until you are certain you thoroughly understand it. Hold your fire! Do not automatically assume that you are right and someone else is wrong. Instead, listen intently to understand thoroughly the viewpoint expressed by the lecturer. Only after you have done so should you venture to ask intelligent questions for clarification and explanation—not to attack.

Don't?

Outside the Classroom When you are listening to your peers, interruption usually comes easily and quickly, and what could have been a profitable discussion often disintegrates into a shouting match. Remember: You learn much more by listening than by talking. When you talk, you're repeating what you already know. When you listen, you're open to ideas and facts that are probably new to you.

Remember: You learn MORE when you LISTEN.

Listening for Ideas

Notes: facts

Don't imitate the detective who says, "The facts, ma'am, just stick to the facts." When you take notes, you do need to take down the facts, but in doing so, try to see what the facts are leading to. Try to see what principle or what idea they are supporting. Try to see how the pieces of the puzzle fit into the building of the big picture. This approach will keep you concentrating at a 100 percent level.

Outside the Classroom

When your peers pour out facts, try to go one step further by thinking, "What is his motivation to tell me this?" or "What is she leading up to?" Your aim is not to psych out anyone; instead, it is to keep your mind fully occupied and agile.

Being a Flexible Note Taker

Flexibility in note taking depends on informed listening. Informed listening means that the listener is able to identify the organizational patterns used by the speaker. When you have detected a pattern, you can anticipate the form of the message and adjust the way you record your notes.

Organizational patterns are easily recognizable if you know their basic structures in advance. (Nine of the most common organizational patterns are described in Chapter 8.) Now, instead of hearing just a continuous, undifferentiated outpouring of facts and ideas from a lecturer, you'll recognize the organizational pattern (the framework) that the speaker is using to present facts and ideas in a controlled, logical manner. Almost instantly, as an informed listener, you will see what the lecturer is doing; thus, you'll be able to understand more readily and, equally important, take notes more systematically and economically.

Often a lecturer will use several of the patterns in one lecture; knowing the patterns, you'll be a flexible note taker by adjusting to the changing patterns.

Outside the Classroom

When you are listening to any talk or conversation, try to detect the organizational pattern the speaker is using. If there is none, speculate on how the ideas or facts being poured forth could be better organized if one of the nine patterns were used.

Converse? Detect organizational pattern

Working at Listening

A good listener is alert, outwardly calm but inwardly dynamic, and sits toward the front of the classroom. While taking notes the listener may nod in

Good Listener: alert, calm, dynamic, sit at front of class room

agreement or look quizzical when the presentation becomes unclear. Such activity promotes comprehension and learning by the listener and provides encouragement to the speaker.

Look interested

Outside the Classroom Active listening results in better understanding for the listener and is appreciated by the speaker.

Resisting Distractions

There are distractions aplenty in the classroom: antics of other students, whisperings, the speaker's dress and mannerisms, outside noise, and outside views. The best way to resist distractions and maintain your concentration is to rivet your eyes on the speaker when you have a chance and focus on taking notes the rest of the time.

WAP NOT TO BE DISTRACTED?

Outside the Classroom Don't watch some other person or activity while pretending to listen to the person speaking to you. Keep your eyes on the speaker just as you would want a listener to look at you while you are speaking.

on the speaker

Exercising Your Mind

More than just occasionally, sit in on lectures in fields that you know very little about. Try hard to follow the lecturer's chain of thoughts and ideas. Portions of the lecture will be unintelligible to you, but you're bound to understand parts. Such listening is hard work, but just as hard work in the gym strengthens your muscles, the hard work of listening will strengthen your will to concentrate and your power to persist.

hard work listening

Outside the Classroom When a discussion is going on among your friends who are majoring in subjects that are foreign to you, listen and ask questions. You'll be surprised how willing they'll be to answer you.

Do what?

Keeping Your Mind Open

There are many touchy subjects of great importance in the news. You may have taken a strong position on some and a lukewarm position on others. When a lecturer uses inflammatory words to express a position contrary to yours, you are likely to harbor negative feelings toward the lecturer.

open-mind

It is hard to believe that a word or phrase can cause an emotional eruption. Among poor listeners, however, that is frequently the case, and even among very good listeners fireworks occasionally go off. Words that are red flags for some listeners include *activist, liberal, conservative, evolution, creationism, feminist, abortion, pro-life, and free market*.

Dealing with highly charged language is similar to dealing with a fear or phobia. Often the emotional impact of the words can be decreased through a frank and open discussion. Genuinely listen to the other point of view. You might learn something that you didn't know before.

Outside the Classroom Be kind and fair to your friends. Don't spring to the attack. Inform yourself of both sides of an issue and focus on facts rather than opinions.

Don't attack Friends

Using Your Thought Speed

One of the inherent problems with listening to lectures is that thought is faster than speech; that is, you can internalize information faster than it is spoken. When a lecturer speaks, a listener has moments of free time to dart off on mental side trips. To keep your mind from wandering as a result of this "thought speed," concentrate fully on what the speaker is saying. When you have time to think between ideas, mentally enumerate the ideas that have been expressed and then summarize them. Keep alternating in this fashion throughout the lecture.

Outside the Classroom In a conversation with your peers, do the same: Listen, then enumerate; listen, then summarize.


LISTEN FOR SHIFTS IN INTONATION

so many words

Clearly, lecturers aren't able to use different kinds of type such as bold letters for emphasis, but they do have analogous tools at their disposal: their voices. Most college lecturers speak about 120 words per minute, which means that in a fifty-minute lecture you hear roughly six thousand words. Listening for signals in a lecture is an especially helpful activity because, unlike in reading, you don't have the luxury of retracing your steps if you discover that you're lost. In addition to words, intonation—variations in the lecturer's voice—is the most significant signal in spoken language. Intonation has three components: volume, pauses, and cadence.

Intonation:


1. volume
2. pauses
3. cadence

Volume In general, the introduction of a crucial idea is preceded by a change in volume; the speaker raises or lowers his or her voice. *voice* 

Pauses By pausing before and after main ideas, a speaker sets these ideas apart from the rest of the lecture. She or he uses pauses to achieve a dramatic effect and, on a practical level, to provide note takers with extra writing time.

Pause = dramatic effect

Cadence The rhythm of a lecturer's speaking patterns can be particularly helpful. Often, like the bulleted lists you find in textbooks, the speaker lists a series of important ideas by using a steady speaking rhythm, sometimes even beginning each idea with the same words or phrase. Whenever you detect these oral signals, your pencil should be moving steadily, adding these important points to your notes.

Pattern rhythm 

We need to remember that the central ingredient that makes for a good listener is concentration. The speaker's words almost always have to penetrate a thick screen of physical and psychological distractions. It is the active listener who, by concentration, parts the screen so that the message-words can reach the ears and mind.

SUMMARY

What is comprehensive listening?

feedback

Comprehensive listening has to do with the feedback between speaker and listener. The speaker has an obligation to make his or her words understandable to the listener. The listener, in turn, must let the speaker know when he or she doesn't understand.

What's the best way to let the speaker know that I don't understand? *"?"*

What should I do if the lecturer asks me a question? *Repeat "?"*

or paraphrase

Aren't listening and hearing basically the same?

No

Hear = act

Listening = choice

Ask questions. A surprising number of students are too embarrassed to ask questions. The only dumb questions, however, are the ones that go unasked.

Simply start by paraphrasing or repeating the question. That will keep you on track, give you some time to warm up your thinking, and enable you to compose a well-focused opening statement.

No. Hearing is a spontaneous act. Listening, by contrast, is something you choose to do. Listening requires you not only to hear what has been said but to absorb the meaning as well.

How do I go about being an active listener?

triple-A listening

What is deep cognition?

deep thinking

What's the best way to concentrate?

Anticipation
Review notes

What are the ten keys to effective listening?

Reread

How do I recognize the lecturer's intonational cues?

Three: voice
Pauses
Rhythm

Use the triple-A listening rules: Go to class with a positive attitude; pay attention; adjust to the lecturer's speed and topic.

Deep cognition, or deep thinking, is the process that moves information from the uncertainty of your short-term memory to the safety of your long-term memory.

Start with anticipation. Look at your notes from the last lecture or peek ahead in your textbook. Either way, you'll be cultivating the mindset that is needed for 100 percent concentration during a lecture.

The keys are (1) finding areas of interest; (2) judging content rather than delivery; (3) holding your fire when you disagree with what's being said; (4) listening for ideas, not just facts; (5) being a flexible note taker; (6) working at listening instead of faking attention; (7) resisting outside distractions; (8) exercising your mind with challenging material; (9) keeping your mind open, even when you hear emotional words; and (10) putting new ideas to work during a lecture.

Listen for these three: raising or lowering of voice, pauses between ideas or facts, rhythm of lecturer's speaking pattern.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Through listening, the meanings of words and sentences are _____.
reflected increased absorbed
2. A good listener places great emphasis on the speaker's _____.
delivery appearance facts
3. In listening, the most productive attitude is _____.
combative sympathetic emotional

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------|---|
| _____ 1. Attention | a. Percentage of students who are hesitant to ask a clarifying question |
| _____ 2. Evolution | b. Sometimes faked by a poor listener |
| _____ 3. Facts | c. Common pattern in science lectures |
| _____ 4. 53 percent | d. Percentage of communication time devoted to listening |
| _____ 5. Process | e. May be a red flag for some listeners |
| _____ 6. Questions | f. Percentage of a lecture that is remembered after forty-eight hours |
| _____ 7. 70 percent | g. Can benefit both the speaker and the listener |
| _____ 8. 25 percent | h. Often the sole concern of a poor listener |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Roughly 50 percent of a ten-minute lecture is forgotten immediately.
- _____ 2. The good listener tunes out dry topics.
- _____ 3. Concentration means thinking only one thought at a time.
- _____ 4. The only dumb question is the one that is never asked.
- _____ 5. Words are processed into ideas through deep cognition.

Multiple choice. Choose the phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Listening is
 - a. strictly mechanical.
 - b. the same as hearing.
 - c. not automatic.
 - d. all the above.
2. When you disagree with a lecturer's statement,
 - a. begin rehearsing your rebuttal.
 - b. automatically decide he or she is misinformed.
 - c. take his or her stand as a bias.
 - d. make a note of it, but keep on taking notes.

3. In active listening, you
- take notes of ideas as well as details.
 - listen for the hard facts, too.
 - convert words into ideas.
 - do all the above.

Short answer. Supply a brief answer for each of the following items.

- Of the ten bad habits of listening, which one habit is the most devastating? Why?
- Why is the triple-A listening technique a good nutshell method?
- Which of the ten effective listening skills is the most important? Why?
- What is the main value of listening and interpreting a speaker's intonation?

THE WORD HISTORY SYSTEM

broker bro'-ker *n.* 1. One that acts as an agent for others, as in negotiating contracts, purchases, or sales, in return for a fee or commission. 2. A stockbroker.

Broker: *originally, a retail vendor of wine*



The modern *broker* who engages in large-scale financial operations takes his name from a humble origin. *Broker* (spelled in Middle English *brocour*) appears to be derived from Old French *broquier* or *brokier*, dialect for *brochier*, “a broacher,” “one who broaches or taps” a cask to draw off the liquor. The modern verb *broach*, besides meaning “to tap” a cask, is used in a figurative sense of “to open,” as in “the subject was *broached*.” So the original *broker* was a retail vendor of wine, and later, any small retailer, middleman, peddler, or agent in general, as a *pawnbroker*. More dignified commodities, such as stocks and bonds, have in modern times dignified the *broker* and his occupation.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Early in life I had to choose between honest *arrogance* and *hypocritical humility*. I chose honest arrogance and have seen no occasion to change.

—Frank Lloyd Wright (1867–1959), American architect

- | | | | |
|---------------------------------|-------------|-------------|------------|
| 1. honest <i>arrogance</i> | design | pride | simplicity |
| 2. <i>hypocritical</i> humility | insincere | energetic | blatant |
| 3. hypocritical <i>humility</i> | flamboyance | disapproval | meekness |

Discipline is the soul of an army. It makes small numbers *formidable*, *procures* success to the weak, and *esteem* to all.

—George Washington (1732–1799), first president of the United States

- | | | | |
|--|------------|---------|-----------|
| 4. makes . . . <i>formidable</i> | manageable | awesome | desirable |
| 5. <i>procures</i> success | preserves | obtains | assumes |
| 6. <i>procures</i> . . . <i>esteem</i> | respect | unity | success |

There is a *syndrome* in sports called “paralysis by analysis.”

—Arthur Ashe (1943–1993), American tennis champion

- | | | | |
|--------------------------------|--------|----------|----------------|
| 7. a <i>syndrome</i> in sports | saying | strategy | characteristic |
|--------------------------------|--------|----------|----------------|

TAKING GOOD NOTES

Learn, compare, collect the facts!

—IVAN PETROVICH PAVLOV (1849–1936), RUSSIAN PHYSIOLOGIST

Learning begins with information gathering. The lectures you hear in class provide the raw material for knowledge. Because you spend so much of your academic life accumulating information, it's unwise to do so haphazardly. To help you accumulate information in an orderly and systematic way, this chapter focuses on:

- The importance of notes
- The Cornell System
- Efficient recording
- Abbreviations and symbols
- Periodic reviews
- Types of notes
- Tips and tactics

TAKING GOOD NOTES

Importance
of Notes

Types of
Notes

Topic
Notes

Sentence and
Paragraph
Notes

Abbreviations
and Symbols

Periodic
Reviews

Tips and
Tactics

Using the
Cornell
System

Include a
Cue Column

Leave Room
for Summaries

Create a Flexible
Note-Taking
Area

Recording
Information
Efficiently

Adopt the
Modified
Printing Style

Record
Information
Selectively

Use
Telegraphic
Sentences

Why take notes? Why not just sit back and listen attentively? This section answers your questions.

THE IMPORTANCE OF NOTES

The primary goal of note-taking is to provide you with a written record of what you've heard. Your short-term memory isn't equipped to retain all the ideas in a typical lecture. As a result, forgetting can be instantaneous and complete. For example, who hasn't forgotten a name only minutes after an introduction? Or had to reread a telephone number after getting a busy signal? Who would rely only on his or her memory in any academic course? Carefully controlled research further points out memory's fragility. Experiments have shown that unrehearsed information is sometimes forgotten in as little as twenty seconds.¹ In a classical experiment, Hermann Ebbinghaus examined the rate of forgetting by studying how easily he could relearn a list after different time intervals. At first, forgetting was rapid and occurred within almost the first hour, but after eight hours, further forgetting occurred at a relatively slow rate. In short, Ebbinghaus found that almost half of what is learned is forgotten within an hour.² Recently, psychologists carrying out experiments similar to Ebbinghaus's affirmed his findings.

The following true story further confirms the rapidity and scope of forgetting. Three professors eating lunch in the faculty lounge had this conversation:

CLYDE: Did you hear last night's lecture?

WALTER: No, I was busy.

CLYDE: Well, you missed one of the best lectures in recent years.

LEON: I agree. The four points that he developed were gems.

CLYDE: I never heard anyone make his points so clearly.

WALTER: I don't want you to repeat the lecture, but what were those four points?

LEON: (Long silence) Clyde? (Passage of two or three minutes; seems like an hour.)

LEON: Well, I'd better get back to the office.

CLYDE: Me, too!

WALTER: Me, too!

Both Leon and Clyde were brilliant men, yet neither of them was able to recall even a fragment of any point made in the previous night's lecture.

¹Douglas A. Bernstein, Edward J. Roy, Thomas K. Srull, and Christopher D. Wickens, *Psychology* (Boston: Houghton Mifflin, 1988), p. 293.

²Alan J. Parkin, *Memory: Phenomena, Experiment and Theory* (Cambridge, MA: Blackwell, 1993); Hermann Ebbinghaus, *Memory* (New York: Dover, 1964), p. 76.

Each had forgotten the four points because neither had transferred the points from short-term memory to long-term memory by silently reciting them. Instead, they both had recited that the speaker was clear, forceful, and wise and that he had made four points—and they remembered only what they had recited. As you can surmise from the anecdote, the only sure way to overcome forgetting is by taking notes and then studying and reciting them.

USING THE CORNELL SYSTEM

The notes you jot down can become a handwritten textbook. In fact, in many instances your notes are more practical, meaningful, and up-to-date than a textbook. If you keep them neat, complete, and well organized, they will serve you splendidly.

The best way I know of to ensure that the notes you take are useful is by adopting the Cornell note-taking system, which was developed at Cornell University more than forty years ago. Since then the Cornell System has been adopted by countless colleges and universities not only in the United States but also in other countries, including China. Although the system is far-reaching, its secret is simple: Wide margins on the left-hand side and the bottom of each page provide the keystone.

Although many office and school supply stores now sell Cornell-style note paper, you can easily use a pen and ruler to adapt standard loose-leaf paper to the task. First draw a vertical line down the left side of each page two-and-one-half inches from the edge of the paper; end the line two inches from the bottom of the sheet. This creates the *cue column*. Next draw a horizontal line two inches up from the bottom of the page. This is the border for your *summary area*. The large space to the right of the cue column and above the summary area is where your notes should be taken. Figure 10.1 shows a Cornell note sheet.

Include a Cue Column

The cue column is a two-and-one-half-inch margin on the left-hand side of each page of your note sheets. It helps to ensure that you will actually put the notes to good use instead of simply stashing them away in a notebook until test time.

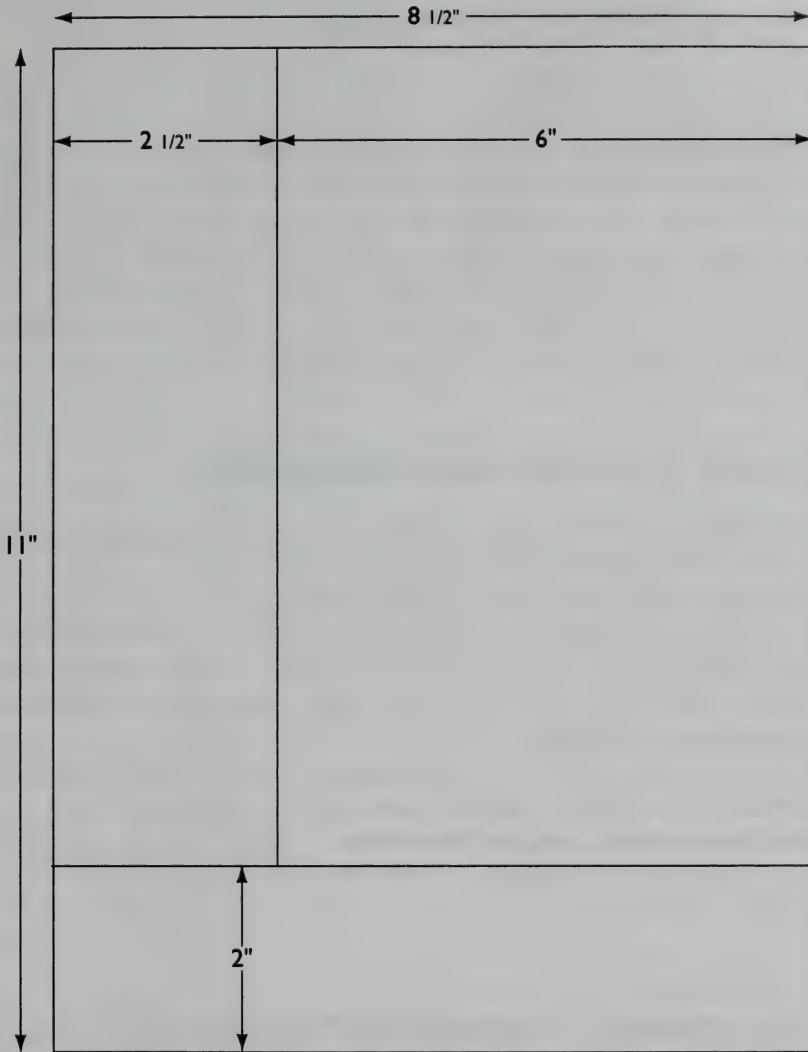


FIGURE 10.1 The Cornell Note Sheet

To use the Cornell System, the student writes notes in the wide ($6"$) column. To study from the notes, the student writes questions in the narrow column and a summary in the space at the bottom of the note sheet.

As you're taking notes, keep the cue column empty. But when you review and recite what you've jotted down, draw questions from the ideas in your notes and write them in the cue column. Writing questions helps clarify meanings, reveal relationships, establish continuity, and strengthen memory.

Leave Room for Summaries

The two-inch space at the bottom of each note sheet is the summary area, in which you sum up each page of your notes in a sentence or two. The virtues of the summary area are twofold. Not only does it provide a convenient in-a-nutshell version of a page full of notes; it also helps you step back and look at the implications of what you've written down. There's always a danger that in paying close attention to the specific facts and details that make up your notes, you lose sight of their overall meaning. By encouraging you to look at "the big picture," the summary area provides perspective and helps avoid this potential note-taking pitfall.

Create a Flexible Note-Taking Area

The information that goes in the largest space on the page varies from class to class and from student to student. Different courses come with different demands. The format you choose for taking your notes and the ideas you take down are almost entirely up to you. If you have a special way of jotting down your notes, you should be able to use it with the Cornell note sheet. Figures 10.2 and 10.3 show notes taken on a Cornell note sheet for two different subjects.

In general, however, avoid taking notes in outline form because this forces you to fit the material into a highly regimented pattern. It's fine to indent and even number your notes, but don't get so caught up in numbers, letters, and Roman numerals that you overlook content.

THE CORNELL SYSTEM FOR TAKING NOTES IN STEPS

The Cornell note-taking system is more than a sheet of paper on which to take notes. It is a system that efficiently takes you through a completely natural learning cycle on the same sheet of paper.

First, capture the lecturer's ideas and facts in the six-inch column.

Second, at your next free period or at the latest during your evening study time, read over your notes to fill in any gaps and to make words more legible. Do this while the lecture is still relatively fresh in your mind.

Third, determine the first main idea put forth by the lecturer. Then in the cue column write a question based on the main idea.

<p>How do psychologists account for remembering?</p> <p>What's a "memory trace"?</p> <p>What are the three memory systems?</p> <p>How long does sensory memory retain information?</p> <p>How is information transferred to STM?</p> <p>What are the retention times of STM?</p> <p>What's the capacity of the STM?</p> <p>How to hold information in STM?</p> <p>What are the retention times of LTM?</p> <p>What are the six ways to transfer information from STM to LTM?</p>	<p>Psych. 105 – Prof. Martin – Sept. 14 (Mon.)</p> <p><u>MEMORY</u></p> <p>Memory tricky – Can recall instantly many trivial things of childhood, yet forget things recently worked hard to learn & retain.</p> <p>Memory Trace</p> <ul style="list-style-type: none"> — Fact that we retain information means that some change was made in the brain. — Change called "memory trace." — "Trace" probably a molecular arrangement similar to molecular changes in a magnetic recording tape. <p>Three memory systems: sensory, short term, long term.</p> <ul style="list-style-type: none"> — <u>Sensory</u> (lasts one second) Ex. Words or numbers sent to brain by sight (visual image) start to disintegrate within a few tenths of a second & gone in one full second, unless quickly transferred to S-T memory by verbal repetition. — Short-term memory [STM] (lasts 30 seconds) <ul style="list-style-type: none"> • Experiments show: a syllable of 3 letters remembered 50% of the time after 3 seconds. Totally forgotten end of 30 seconds. • S-T memory — limited capacity — holds average of 7 items. • More than 7 items — jettisons some to make room. • To hold items in STM, must rehearse — must hear sound of words internally or externally. — Long-term memory [LTM] (lasts a lifetime or short time). <ul style="list-style-type: none"> • Transfer fact or idea by <ol style="list-style-type: none"> (1) <u>Associating</u> w/information already in LTM. (2) <u>Organizing</u> information into meaningful units. (3) <u>Understanding</u> by comparing & making relationships. (4) <u>Frameworking</u> — fit pieces in like in a jigsaw puzzle. (5) <u>Reorganizing</u> — combining new & old into a new unit. (6) <u>Rehearsing</u> — aloud to keep memory trace strong.
<p>Three kinds of memory systems are sensory, which retains information for about 1 second; short-term, which retains for a maximum of 30 seconds; and long-term, which varies from a lifetime of retention to a relatively short time.</p> <p>The six ways (activities) to transfer information to the long-term memory are associating, organizing, understanding, frameworking, reorganizing, and rehearsing.</p>	

FIGURE 10.2 A Cornell Note Sheet with Jottings in the Cue Column and Summary Area

<p>What is the extent of grasslands?</p> <p>What four purposes are served by grass?</p> <p>Name some foods (cereals) provided by grass.</p> <p>What other foods stem from grass?</p> <p>How do spiders affect our food supply?</p> <p>How many spiders per acre of grassland?</p> <p>Where are spiders found — extent geographically?</p> <p>How many harmful?</p>	<p>Environmental Sciences Mr. R. Evans — May 4th</p> <p>A. Food from grasses — & attributes</p> <ol style="list-style-type: none"> 1. Grass covers 1/4 of earth — 6,000 kinds <ol style="list-style-type: none"> a. food for people & animals b. retards erosion c. beauty around homes & parks d. provides houses, tools, bowls, paper = bamboo 2. Food <ol style="list-style-type: none"> a. wheat & rye = bread fr. flour b. seeds as cereals = corn, rice, oats, barley c. sugarcane is giant grass = sugar 3. Grass into meat <ol style="list-style-type: none"> a. cattle, sheep, goats, etc. b. dairy cows = milk, cheese c. horses = for work & pleasure <p>B. Relationship — spiders to food</p> <ol style="list-style-type: none"> 1. If spiders disappeared, we'd starve within few months — use up canned & frozen food = starve 2. Billions of insects would devour — destroy crops & pastures 3. Spiders eat mountains of insects day & night 4. Density = about 2 million spiders in acre of grassland 5. Widespread — universal <ol style="list-style-type: none"> a. In mountains (22,000 ft.) in snow & ice b. In mines = 2,000 ft. down c. In nests of birds, squirrels, mice 6. Spiders never eat vegetables — only insects 7. 50,000 different kinds — less than dozen harmful — harmful when feet or hands in nests (webs) 8. Our lives depend on spiders — yet, we kill them — what a way to treat a friend!
<p>Grass covers 1/4 of the earth & is food — source for both humans and animals. Grass produces wheat, rye, corn, rice, oats, barley, etc. Grass is the basis for producing meat, milk, cheese, etc.</p> <p>If it were not for the immense population of spiders that eat insects, the insect population would immediately zoom tremendously and consume all grasses—thus, cutting off the food supply. Starvation would result within a matter of a few months. (Own thought: The sea would be the only source of food. Also, the Eskimo would be able to survive.)</p>	

FIGURE 10.3 Cornell Note Sheet Showing a Simple Alphabetical and Numerical Organization but Not a Formal Outline

Fourth, with a plain sheet of paper, block out the notes in the six-inch column, leaving exposed only the question in the cue column. Now glance at the question, then recite aloud, in your own words, the idea or fact needed to answer the question. After reciting, slip the plain sheet down to check your recitation. If your answer was incorrect or incomplete, cover the notes and recite again. It is important to establish an accurate, crisp, clear image in your memory at the very beginning.

Fifth, at the bottom of the sheet, write a summarizing statement—a concise, in-a-nutshell version of a page full of notes. These summaries will make studying for exams, especially the final one, remarkably efficient. Furthermore, by writing summaries, you will become a better thinker and writer.

Sixth, review your notes immediately so that you end up with a view of the whole rather than isolated facts and ideas. In addition to getting a global view, an immediate review impresses the fresh lecture in your memory. As you learned in Chapter 5, yesterday's knowledge interferes with today's knowledge and today's interferes with yesterday's. The battle between remembering and forgetting goes on continuously. The only way you can influence the outcome of this battle is by reviewing your notes regularly. No matter how busy you are, make it a habit, before settling down to study, to quickly review your previously taken notes on the subject you're about to study. Short, fast, frequent reviews will produce far better understanding and remembering than long all-day or all-night sessions.

Last, start the process of reflection. Ask yourself: What's the significance of these facts and ideas? What principles are they based on? How can I apply them to what I already know? How do they fit? What's beyond these facts and ideas?

RECORDING INFORMATION EFFICIENTLY

Strive to make your note taking both speedy and sparing. Of course, if you scribble down information too quickly, your notes may be illegible. And if you're too choosy about what you record, you may be left with costly gaps in your information. The way to circumvent these problems and record legible, useful notes at a reasonable speed is by adopting the modified printing style, using telegraphic sentences, and recording selectively.

Adopt the Modified Printing Style

Poor handwriting need not keep you from taking legible notes. You can develop legible writing by adopting the *modified printing style*, a system that combines the rapidity of writing with the legibility of printing. Letters are

formed smoothly, as with cursive or longhand writing, but are punctuated with the sort of stops and starts characteristic of printing. That means your words take on a cursive look, and at the same time the periodic breaks between letters prevent your writing from eroding into an unreadable blur.

What makes the modified printing style so effective and easy to learn is that it combines your style of printing with your style of cursive in a mixture that brings out the best elements of both. Here's how:

a b c d e f g h i j k l m n o p q r s t u v w x y z

Figure 10.4 shows how modified printing looks in a typical paragraph.

Use Telegraphic Sentences

Long before e-mail and the fax were invented, important business and personal messages were sent by telegraph. The sender paid by the word; the fewer the words, the lower the cost. A three-word message such as "Arriving three pm" was much less expensive than an eleven-word message: "I will arrive home promptly at three o'clock in the afternoon."

Of course, taking notes doesn't cost money, but it does cost time. You can save time and still extract the important information from lectures by using telegraphic sentences in your notes. To do so, leave out unnecessary words such as articles (*a, an, the*), abbreviate words you use often (see pages 247–249 and Figures 10.10 and 10.11 on pages 249–250), and streamline definitions by using a colon (:) or a dash (—). Two examples of this telegraphic style are shown in Figure 10.5.

Record Information Selectively

Taking thorough notes, regardless of the format you choose, should not mean writing down everything you hear. Your emphasis should be on the ideas, not the words. And you don't want all the ideas, either, just the key ones (as Figure 10.6 shows), along with any details or examples you need to make those ideas easier to understand.

There are four advantages to using this modified printing style. First, it is faster than cursive writing; second, it is neater, permitting easy and direct comprehension; third, it saves time by precluding rewriting or typing; and fourth, it permits easy and clear re-forming of letters that are ill-formed due to haste.

FIGURE 10.4 Modified Printing Style

Sentence Notes

In most instances, sentence notes written in a telegraphic style will be the most efficient way to record a lecture. Be flexible, though, because (as Figure 10.7 shows) you might have to switch from one type of notes to another.

Topic-Idea Notes

The topic-idea format is often useful in history, economics, and philosophy courses. The lecturer mentions a topic and then expands on it. Notice that in Figure 10.8 the “paragraph” about the law of diminishing returns is broken up by two subtopic indicators to show separate ideas.

Paragraph Notes

If the lecturer is expounding on an idea in a straightforward fashion, don’t try to impose some sort of topic and subtopic organization where there is none. Instead, write short, telegraphic sentences and end up with an almost solid paragraph, as shown in Figure 10.9.

Lecture's words

In marketing, we try to understand customers' needs and then respond to them with the right products and services. In the past, firms often produced goods first and tried to fit the customer's needs to the goods. Today's world-class marketers pride themselves on their customer orientation. We begin with the customer and build the product or service from there. A good example is McDonald's, the fast-food chain, which tailors its menus to local tastes and customs when it opens fast-food outlets in Moscow and other international locations.

Student's telegraphic sentences

1. *Marketing understands customers' needs first.*
 - a. *In past, firms produced goods first, then fit them to customers.*
 - b. *World-class = having customer orientation.*
 - c. *Ex. McDonald's in Moscow*

Lecture's words

The US Patent Office has granted numerous patents for perpetual motion machines based upon applications with complete detailed drawings. Some years ago, though, the patent office began requiring working models of such a machine before a patent would be granted. Result: No patents granted for perpetual motion machines since that time.

Student's telegraphic sentences

Perpetual motion machine (drawings) = many patents.
Required working model = no patents since.

FIGURE 10.5 Examples of Telegraphic Sentences

<p>What's sympathetic magic?</p> <p>Describe contagious magic.</p>	<p>Oct. 10 (Mon.) – Soc. 102 – Prof. Oxford</p> <p>A. Two kinds of magic</p> <ol style="list-style-type: none"> 1. Sympathetic — make model or form of a person from clay, etc. — then stick pins into object to hurt symbolized person. 2. Contagious magic <ol style="list-style-type: none"> a. Need to possess an article belonging to another person. b. Ex. Fingernail clippings. By doing harm to these objects, feel that harm can be transmitted.
--	---

FIGURE 10.6 Topic-Explanation Notes

<p>What's animism?</p> <p>Describe mana!</p> <p>How to gain mana?</p> <p>Who has mana?</p>	<p>Oct. 10 (Mon.) – Soc. 102 – Prof. Oxford</p> <p>A. Animism</p> <ol style="list-style-type: none"> 1. Object has supernatural power 2. Power called mana (not limited to objects) <ol style="list-style-type: none"> a. Objects accumulate mana Ex. Good canoe – more mana than poor one. b. Objects can lose mana c. People collect objects w/lots of mana d. Good person's objects collect mana e. People, animals, plants have mana, too. Ex. Expert canoe builder has mana – imparts mana to canoe f. Chief has lots of mana – dangerous to get too close to chief – mana around head.
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FIGURE 10.7 Sentence Notes

<p>What is the Law of Diminishing Returns?</p> <p>What is Malthus's Law?</p>	<p>Oct. 27 (Wed.) – Economics 105 – Prof. Terry</p> <p><u>Some Basic Laws & Principles</u></p> <ol style="list-style-type: none"> 1. Law of Diminishing Returns <ol style="list-style-type: none"> a. Refers to amount of extra output (production) we get when we add additional inputs, but after a point, the extra inputs yield decreasing amounts of extra output. b. Malthus's views depended on this law = Just so much land, but population could increase more rapidly than food supplies.
--	---

FIGURE 10.8 Topic-Idea Notes

<p>What is the Greek concept of a well-rounded person?</p>	<p>Nov. 6 (Mon.) – World Lit. 106 – Prof. Warnek</p> <p><u>Greece</u></p> <ol style="list-style-type: none"> 1. Unity = well rounded <p>Early Greeks vigorous. Goal was to be well rounded: unity of knowledge & activity. No separate specializations as law, literature, philosophy, etc. Believed one person should master all things equally well; not only knowledge, but be an athlete, soldier, & statesman, too.</p>
--	--

FIGURE 10.9 Paragraph Notes

ABBREVIATIONS AND SYMBOLS

You should use only the abbreviations that fit your needs and that you will remember easily. A good idea is to introduce only a few abbreviations into your note taking at a time. Overuse may leave you with notes that are difficult to read. On pages 247–248 are some rules and examples of each.

1. Symbols are especially helpful to students in engineering and mathematics. Lists of commonly used symbols are given in most textbooks and reference books.

≠	does not equal	f	frequency
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2. Create a family of symbols.

○	organism	⑤	individuals
⊙	individual		

3. Leave out the periods in standard abbreviations.

cf	compare	dept	department
eg	for example	NYC	New York City

4. Use only the first syllable of a word.

pol	politics	lib	liberal
dem	democracy	cap	capitalism

5. Use the entire first syllable and only the first letter of a second syllable.

subj	subject	ind	individual
cons	conservative	tot	totalitarianism

6. Eliminate final letters. Use just enough of the beginning of a word to form an easily recognizable abbreviation.

assoc	associate, associated	chem	chemistry
ach	achievement	conc	concentration
biol	biological	max	maximum
info	information	rep	repetition
intro	introduction		

7. Omit vowels from the middle of words, and retain only enough consonants to provide a recognizable skeleton of the word.

bkgd	background	estmt	estimate
ppd	prepared	gvt	government
prblm	problem		

8. Use an apostrophe.

gov't	government	cont'd	continued
am't	amount	educat'l	educational

9. Form the plural of a symbol or abbreviated word by adding "s."

□s	areas
chaps	chapters
co-ops	cooperatives
f _s	frequencies
/s	ratios
10. Use "g" to represent *-ing* endings.

decr _g	decreasing
ck _g	checking
est _g	establishing
expt _g	experimenting
11. Use a dot placed over a symbol or word to indicate the word *rate*.

\dot{v}	vibration rate
\dot{f}	frequency rate
12. Generally, spell out short words such as *in*, *at*, *to*, *but*, *for*, and *key*. Symbols, signs, or abbreviations for short words will make the notes too dense with "shorthand."
13. Leave out unimportant verbs.
14. Leave out the words *a* and *the*.
15. If a term, phrase, or name is initially written out in full during the lecture, substitute initials whenever the term, phrase, or name is used again.
 Initial writing: Modern Massachusetts Party
 Subsequently: MMP
16. Use symbols for commonly recurring connective or transitional words.

&	and
w/	with
w/o	without
vs	against
∴	therefore

Speed Notes for Engineers and Technicians

Many symbols and abbreviations are widely used in technical fields. They will probably cut your writing time in half. Some of the basic symbols are shown in Figure 10.10. Common technical abbreviations are given in Figure 10.11.

Other symbols and abbreviations for many different technical and nontechnical fields are often found in special sections of unabridged dictionaries. Look them up the next time you are in the library.

TIPS AND TACTICS

If you turn the following tips and tactics into habits, your notes will be an invaluable resource to you. Use these tips and tactics until they are second nature to you.

Use the Two-Page System

When you need to scramble to keep up with a fast-talking lecturer, you may find this two-page system helpful. Here's the way it works: Lay your binder or notebook flat on the desk. On the left-hand page, record main ideas only. This is your primary page. On the right-hand page, record as many details as you have time for. Place the details opposite the main ideas they support.

$+$	plus, positive, and	\updownarrow	vibration, motion
$-$	minus, negative	\log	common logarithm
\times	algebraic x, or multiplied by	\ln	natural logarithm
\div	divided by	ϵ	base of natural logarithms
\neq	does not equal	π	pi
\approx	equals approximately, approximates	\angle	angle
$>$	greater than, greatly, increased, increasing	\perp	perpendicular to
$<$	less than, reduced, decreasing	\parallel	parallel to
\sim	sine curve, cosine curve	a°	a degrees (angle)
\rightarrow	approaches as a limit, approaches	a'	a minutes (angle)
\geq	greater than or equal to	a''	a seconds (angle)
\leq	less than or equal to	\int	integral, integral of, integration
\equiv	identical to	f	frequency
\propto	varies directly as	f_n	natural frequency
\therefore	therefore	<i>cps</i>	cycles per second
$()^{1/2}$	square root	m	mass
$()^n$	nth root	Φ	phase
<i>vs</i>	versus, against	F	force
\equiv	ground	$/$	ratio, the ratio of
\leftrightarrow	varied, variation	π	base, support, mount, foundation
\square	area	$($	curve, curvilinear

FIGURE 10.10 Examples of Technical Symbols

<i>anlys</i>	analysis	<i>pltg</i>	plotting
<i>amplitd</i>	amplitude	<i>reman</i>	remain
<i>asmg</i>	assuming	<i>rsnc</i>	resonance
<i>cald</i>	called	<i>rltnshp</i>	relationship
<i>cnst</i>	constant	<i>smp</i>	simple
<i>dmpg</i>	damping	<i>smpfd</i>	simplified
<i>dmnsls</i>	dimensionless	<i>stfns</i>	stiffness
<i>dfln</i>	deflection	<i>sysm</i>	system
<i>dfnd</i>	defined	<i>sgnft</i>	significant
<i>dstrbg</i>	disturbing	<i>ths</i>	this
<i>efvns</i>	effectiveness	<i>trnsmbsbly</i>	transmissibility
<i>frdm</i>	freedom	<i>thrtly</i>	theoretically
<i>frcg</i>	forcing	<i>valu</i>	value
<i>gvs</i>	gives	<i>wth</i>	with
<i>hrmc</i>	harmonic	<i>whn</i>	when
<i>isltr</i>	isolator	<i>xprsd</i>	expressed
<i>isltn</i>	isolation		

FIGURE 10.11 Typical Technical Abbreviations

Reprinted by permission from G. H. Logan, "Speed Notes for Engineers," *Product Engineering*, September 30, 1963. Copyright © 1963 by Morgan-Grampian, Inc.

After the lecture, remain in your seat for a few minutes and fill in any gaps in your notes while the lecture is still relatively fresh in your mind.

Don't Use a Cassette or Tape Recorder

Do not use a tape or cassette recorder. If you do, you'll be wasting time and not learning very much. When a lecture is on tape, you cannot review it in five or ten minutes; you have to replay the entire lecture. Worst of all, you cannot use the technique of reciting, which is the most effective learning technique known to psychologists. Furthermore, you also lose the advantage of visual learning—that is, seeing the words and seeing the relationship between the written ideas.

Some students create written notes as they listen to the tape in the privacy of their rooms. But these notes could have been taken directly, during the live lecture.

Acknowledge Alternative Learning Styles

There are some extraordinary circumstances when a cassette tape recorder can be a godsend for students who have real difficulty with traditional

note-taking methods. In such cases, the use of a lecture-gathering device is strongly encouraged.

Avoid Shorthand

Don't take lecture notes in shorthand. Shorthand notes cannot be studied effectively while they are still in symbol form. Besides, shorthand symbols still have to be transformed into regular words. If you need a fast method of keeping up with the lecturer, use the abbreviations and the symbols listed in this chapter.

Don't Keyboard Your Notes

Write legibly the first time. Don't rationalize that you'll keyboard your notes when you return to your room. Keyboarding your notes is a waste of time, opportunity, and energy. You'll need almost a full hour to decipher and keyboard one set of scribbled lecture notes. That hour could have been extremely productive if you had spent it reciting notes taken during the lecture. Keyboarding can exhaust you physically, mentally, and emotionally, leaving you unfit for the task of learning.

Contrary to what most people think, almost no learning takes place during the keyboarding of scribbled notes. The act of deciphering and keyboarding requires almost total concentration, leaving scant concentration for comprehending the facts and ideas being keyboarded.

Use Signal Words and Phrases

As mentioned earlier, most college lecturers speak about 120 words per minute. In a fifty-minute lecture, you hear up to six thousand words expressing ideas, facts, and details. To impose some recognizable order on those ideas, facts, and details, lecturers use signal words and phrases. (See Chapter 8.)

Get Ready for the Final Barrage

Pay close attention to the end of the lecture. Speakers who do not pace themselves well may have to cram half the lecture into the last five or ten minutes. Record such packed finales as rapidly as you can. After class, stay in your seat for a few extra minutes to write down as much as you can remember.

Rely on Your Own Instant Replay

As soon as you leave the lecture room, while walking to your next class, mentally recall the lecture from beginning to end. Visualize the classroom and the lecturer and any chalkboard work. After mentally recalling the lecture, ask yourself some questions: What was the lecturer getting at? What really was the central point? What did I learn? How does what I learned fit in with what I already know? If you discover anything you don't quite understand, no matter how small, make a note of it and ask the instructor to explain it before the next class.

Stick to the Basics

As awesome and novel as the idea of a laptop is, the simple, basic paper-and-pencil technique is still preferred. Some disadvantages of using a laptop for taking lecture notes are that (1) it's heavy to carry, (2) you still have to print out your notes, (3) it takes some expertise to copy a diagram or a calculus problem from the chalkboard, and (4) if it is stolen, you might lose not only the laptop but also any lectures that you haven't yet printed.

Arrive Early

Coming to class early enables you to find a good seat, away from distractions inside and outside the room. But best of all, you'll have a few minutes to look over the notes of the previous lecture so that you can connect them with the lecture you are about to hear. Otherwise, you are likely to have a compartmentalized view of each day's lecture. This condition might be depicted by a series of unconnected links:



On the other hand, a brief review just before class will help form a strong chain of association, helping you see the development of the lectures as a continued series:



Don't Miss Class

If you know you'll be missing a class, supply a friend with a cassette or tape recorder and ask him or her to tape the lecture for you. Then you'll be able to take your own notes when you play it back.

TWO DOZEN DO'S AND ONE DOZEN DON'TS

The twenty-four do's and twelve don'ts that follow are the warp and woof of note-taking. Weave them into a magic carpet of your own design and glide over all the rough spots of note taking.

Do's

1. Look over previous notes before class. (Maintains continuity.)
2. Attend *all* lectures. (It's a continuing story.)
3. Be academically aggressive. (Sit up straight with "rolled-up sleeves.")
4. Take a front seat to see and hear better. (You won't dare snooze.)
5. Use a large loose-leaf binder. (Gives ample room.)
6. Carry lined $8\frac{1}{2} \times 11$ loose-leaf sheets to class. (Insert them into a binder afterward.)
7. Write on only one side of the sheet. (Can spread them out for review.)
8. On the top sheet, record the course, lecturer, and date. (In case of spill.)
9. Begin taking notes immediately. (Don't wait for inspiration.)
10. Write in short, telegraphic sentences. (Make them meaningful.)
11. Make notes complete for later understanding. (Don't just sit there puzzling.)
12. Use modified printing style. (Clear letters, not scribbles.)
13. Use the lecturer's words. (Lecturers like to see their words in exams.)
14. Strive to detect main headings. (As if you peeked at the lecturer's notes.)
15. Capture ideas as well as facts. (Get the drift, too.)
16. Keep your note organization simple. (Easy does it.)
17. Skip lines; leave space between main ideas. (Package the ideas.)
18. Discover the organizational pattern. (Like putting together a puzzle.)
19. If the lecture is too fast, capture fragments. (Jigsaw them together later.)
20. Leave blank spaces for words to fill in later. (Thus avoid voids.)
21. Develop your own abbreviations and symbols. (But not too many.)
22. Record the lecturer's examples. (If you don't, you'll forget.)

23. Identify your own thoughts in your notes. (What's mine? What's the lecturer's?)
24. Keep separate loose-leaf binders for each course. (Don't combine notes.)

Don'ts

1. Don't sit near friends. (Can be distracting.)
2. Don't wait for something "important." (Record almost everything.)
3. Don't convert the lecturer's words. (Takes time and invites imprecision.)
4. Don't look for facts only. (See ideas, too.)
5. Don't give up if the lecturer is too fast. (Some is better than none.)
6. Don't stop to ponder. (Do so later in your room.)
7. Don't overindent. (You'll run out of right-side space.)
8. Don't doodle. (Breaks concentration and eye contact.)
9. Don't use spiral-bound notebooks. (Can't insert handouts.)
10. Don't consider any example too obvious. (Copy it!)
11. Avoid using Roman numerals. (You'll get tangled up.)
12. Avoid too many abbreviations. (Trouble deciphering later.)

SUMMARY

Why should I take notes?

Forgetting wipes out information like a tornado. Taking notes will provide disaster relief.

How do I begin taking notes?

A good way to start is with telegraphic sentences. The secret is to record only the keywords.

What's the best way to take notes—with printing or with cursive?

Neither. Use the modified printing style. It's fast and neat, and it saves you time that you might otherwise spend recopying.

Are there some time-wasters in note-taking?

Yes. There are at least three that you should avoid: (1) Never tape a lecture. (2) Don't use shorthand. (3) Don't recopy or keyboard your notes.

How can I use the speaker's signals to my advantage?

Expressions such as "in contrast to" or "to sum up" act as signals and help you identify the pattern of organization the speaker

What do you mean by instant replay?

is following. If you can follow the speaker's organizational pattern, you'll have little trouble fitting in the facts and ideas along the way.

What is the Cornell note-taking system?

As soon as you've left the classroom, take a moment to relive the lecture mentally from start to finish. Reflect on what the instructor has said and what it all means.

How do I use cue questions?

The keystone of the Cornell System is its format, a six-inch area for your lecture notes and a two-and-one-half-inch left-hand margin for cue questions.

What is reflection?

Simply think up a question that can be answered with the information from a full set of facts or a complete idea in the textbook.

When should I review my notes?

Reflection means thinking about and applying the concepts and ideas you learn.

How often should I review?

Right away if possible.

Are abbreviations and symbols a help in note-taking?

As often as possible. If you make an effort to do a quick review of your notes every evening before you begin studying, you'll do a good job of remembering your hard-earned knowledge.

Used sparingly, abbreviations and symbols can be a help. If you use too many, your notes might be difficult to read easily.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Much of the information that a person receives is no longer available after a few _____.
minutes hours weeks
2. The Leon-Clyde anecdote illustrates the problem of _____.
note-taking forgetting recapitulation

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-------------------------------------|--|
| _____ 1. Two-page system | a. Can reveal where a lecture is heading |
| _____ 2. Forgetting | b. Used for cue questions |
| _____ 3. Cornell System | c. Is both instant and massive |
| _____ 4. Two-and-a-half-inch column | d. Ideal format for coping with speedy lecturers |
| _____ 5. Six-inch column | e. Is not recommended as a method of note-taking |
| _____ 6. Shorthand | f. Time-tested method for taking notes |
| _____ 7. Signal words | g. Used for classroom lecture notes |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Notes written in the modified printing style must be keyboarded.
- _____ 2. The goal of note-taking is to capture the lecturer's facts and ideas on paper.
- _____ 3. Taping the lecture is an efficient way to get all the information you need.
- _____ 4. Almost no learning takes place during the act of keyboarding.
- _____ 5. A well-written stack of notes can function as a second textbook.
- _____ 6. The last five or ten minutes of a lecture often contain the greatest concentration of information.

Multiple choice. Choose the phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Telegraphic sentences provide you with
 - a. verbatim notes.
 - b. a secretary-style transcription.
 - c. streamlined information.
 - d. typed documentation.
2. The process of reflection helps you to
 - a. tie facts and ideas together.
 - b. bind new facts and ideas with ones you already possess.
 - c. speculate beyond the facts and ideas.
 - d. benefit from all the above.

3. Arriving early for class enables you to
 - a. sit near friends.
 - b. relax a bit before the lecture.
 - c. review previous notes.
 - d. have your notebook and pencils ready.

Short answer. Supply a brief answer for each of the following items.

1. Why take lecture notes? Discuss briefly.
2. What is the key feature of the Cornell note-taking system? Explain briefly.
3. In the cue column, why use questions instead of cue words?
4. Why a summary area at the bottom of each note sheet? Explain.
5. What is the main advantage of the modified printing style? Explain.

THE WORD HISTORY SYSTEM

calculate cal'-cu-late' v. 1. To ascertain by computation; reckon. 2. To make an estimate of; evaluate.

Calculate *from the counting stones of the Romans*



The Romans had no adding machines. Even the art of writing was known to comparatively few persons. So they did their adding and subtracting with the aid of little stones used as counters. The Latin word for the little stone used in this way was *calculus*, diminutive of *calx*, meaning "limestone." From *calculus* the verb *calcularē*, "to calculate," was formed, and its past participle, *calculatus*, is the immediate origin of English *calculate*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

No amount of *sophistication* is going to *allay* the fact that all your knowledge is about the past and all your decisions are about the future.

—Ian E. Wilson (1941–), chairman, General Electric Corporation

- | | | | |
|--------------------------|----------|------------|------------|
| 1. <i>sophistication</i> | argument | refinement | discussion |
| 2. <i>allay</i> the fact | change | resolve | relieve |

There is always an easy solution to every human problem—neat, *plausible* and wrong.

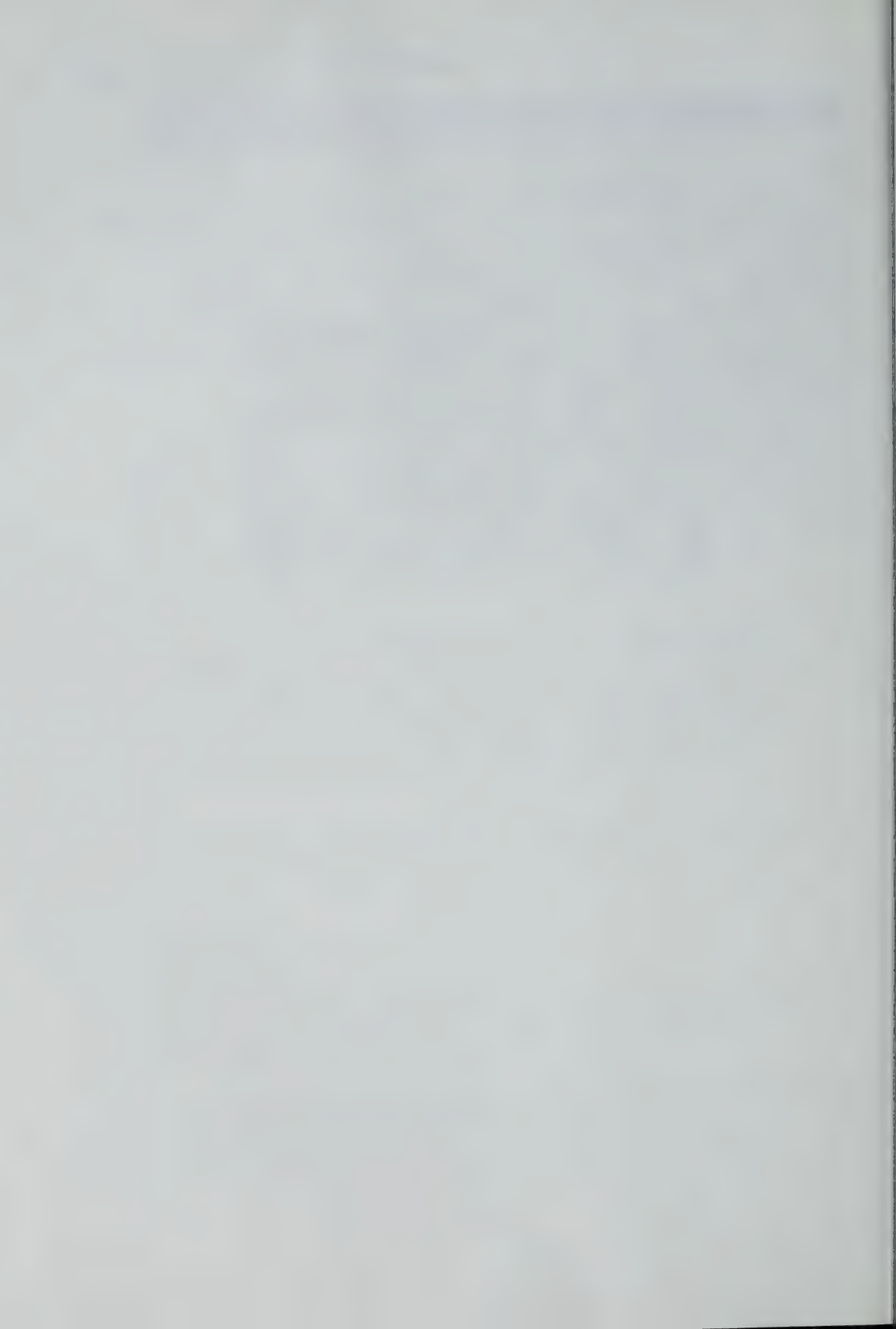
—H. L. Mencken (1880–1956), American editor and critic

- | | | | |
|---------------------|------------|-------|--------------|
| 3. <i>plausible</i> | reasonable | smart | advantageous |
|---------------------|------------|-------|--------------|

A committee is a *cul-de-sac* down which ideas are lured and then quietly strangled.

—Sir Barnett Cocks (1907–), English scientist

- | | | | |
|------------------------|------|-----|----------|
| 4. a <i>cul-de-sac</i> | trap | net | dead end |
|------------------------|------|-----|----------|



LEARNING FROM YOUR TEXTBOOKS

There is a great difference between knowing a thing and understanding it.

—CHARLES KETTERING (1876–1958), AMERICAN ELECTRICAL ENGINEER AND INVENTOR

Are you going hungry? Some students devour their textbook assignments yet never learn a thing. That's because learning from a textbook involves more than just reading. It means digesting what you read. A textbook assignment needs to be read actively in order to provide food for thought. This chapter discusses:

- Getting acquainted with your textbooks
- Adopting an active approach to learning
- Using the SQ3R System
- Using the Questions-in-the-Margin System

LEARNING FROM YOUR TEXTBOOKS

Getting Acquainted with Your Textbooks

Read the Introductory Material

Look for Typographical Cues

Adopting an Active Approach to Learning

Talk with Your Textbook

The SQ3R System

Survey (Skim) Chapter

Turn Captions into Questions

Read to Answer Your Question

Recite to Gain Remembering

Review to Gain Overview

The Questions-in-the-Margin System

Surveying a Textbook Chapter

Turning Headings into Questions

Reading Paragraph by Paragraph

Writing Questions in the Margin

Reciting Based on the Questions in the Margin

Reviewing Immediately and Later

Reflecting on Facts and Ideas

Because you and your textbooks are going to spend a quarter or a semester together, you'd better become friends. How? By getting acquainted.

GETTING ACQUAINTED WITH YOUR TEXTBOOKS

Buy all your textbooks immediately after you register. This is a wise policy even if your school allows a period in which you can attend many courses before deciding on a final few. Get a head start by reading the tables of contents, prefaces, introductions, and any other up-front material in all your books. Underline important words and sentences, and make notes in the margins. Then, while you still have the time, leaf through each of your books. Look at the pictures, tables, and diagrams; read the captions. Read chapter titles and headings and subheadings that interest you. This will give you a good idea of what the book is like and where you will be going during the semester. Later, you'll be glad you did, for you'll be able to see how the various parts of the course fit together.

Read the Prefatory Material

Most textbooks are written in a serious, scholarly tone. In the introductory material—which may be called “Preface,” “To the Student,” “Introduction,” or something similar—the authors often take a more personal approach to their subjects and to their readers than they do in the body of the text. In the introductory material you have a chance to meet the authors as people and to get comfortable with them. Once you do, you'll find that you can converse and even argue with them as you read the text. Now and then, you'll find yourself saying, “No, I don't agree with that statement” or “What do you mean by that?”

In the introductory material you can also find valuable information about the concepts and content of the book. For instance, one student struck pay dirt on page 54 of a ninety-page preface to *A Treatise of Human Nature* by David Hume (1711–1776), a Scottish philosopher. Hume wrote in his preface, “If I find the root of human nature, I'll be able to explain all human actions.” The student accurately interpreted this sentence to mean that Hume would be using a psychological, not a traditional philosophical, approach. Thus, with this proper mental set established, the student was able to read Hume's *Treatise* fairly rapidly and with clear understanding. Students who had not read the author's long preface read the book with a

mental set directed at ascertaining Hume's philosophy. Most of those students never understood what David Hume was trying to explain.

In prefaces you can find valuable information such as (1) what the author's objective is, (2) what the author's objective is not, (3) the organizational plan of the book, (4) how and why the book is different from other books about the same subject, and (5) the author's qualifications for writing the book. As a practical exercise, you might find it interesting to read the preface of this book, if you have not already done so. See how much you can gain toward understanding not only the book but also the author.

The Author's Objective Learning the author's objective—the purpose or goal he or she meant to achieve—enables you to read and interpret the text appropriately. For instance, the authors of *American Government* state their objectives this way:

In preparing the fourth edition, we have thoroughly reviewed and updated all chapters, in terms of both research and current events. As a result, in this edition, we have given additional emphasis to the 1992 and 1994 elections, media and public opinion, the Supreme Court, and domestic and international policy. We have also carefully scrutinized every chapter, refining, clarifying, and tightening the text.¹

These few sentences tell you straight off what you can expect and what particular approach the authors will be taking.

The Organizational Plan of the Book Having the book's organizational plan is like having a road map. You know not only what the authors are doing but also where they are going. In the following example, you're told the title and focus of each of the book's three parts and are given examples of some of the topics that will be covered in each part:

The text is built on a three-part framework. Part One, "Foundations of Communication," introduces basic theoretical concepts, including an overview of the communication process as well as verbal and nonverbal transactions, critical thinking, ethics, and listening.

Part Two, "Personal Communication," covers intrapersonal and interpersonal communication. Personal relationships, communication apprehension, the interview, and small-group functions—among other topics—are discussed.

Part Three, "Public Communication," focuses on planning, developing, structuring, and presenting successful informative, and persuasive briefings and speeches.²

¹Alan R. Gitelson, Robert L. Dudley, and Melvin J. Dubnick, *American Government*, 4th ed. (Boston: Houghton Mifflin, 1996), p. xiv.

²Roy M. Berko, Andrew D. Wolvin, and Darlyn R. Wolvin, *Communicating: A Social and Career Focus*, 5th ed. (Boston: Houghton Mifflin, 1992), pp. xv–xvi.

How and Why the Book Is Different Recognizing what makes the textbook unique enables you to read with greater awareness and comprehension and to avoid the trap of thinking this book is just “more of the same old stuff.” Notice how the specificity of the following example lets you know right away where to direct your attention: “What makes *All of Us* stand apart from other reading texts is its devotion to a curriculum of inclusion. . . . We tried to compile the richest and most ethnically diverse reading matter available.”³

The Author's Qualifications Writers usually try in some subtle way to let the reader know that their book is written by an expert on the subject and that therefore the information is trustworthy and credible. Note in the following example how the writers describe their relationship with the subject matter in a way that inspires confidence and belief in the value of their opinions:

Economically and politically, the world has changed with the initiative of the European Community to reach economic integration (1992 initiative) and the liberalization of Eastern Europe, culminating with the dramatic events in the Soviet Union in August 1991. As authors, we have benefited enormously from being close to these changes, both through our contacts as well as our extended trips and teaching assignments in Europe. In addition, we have worked extensively with companies who are about to embark on new types of global strategies.⁴

Supplementary Learning Aids Most textbook authors provide learning aids to help you understand the material. The introductory material generally names these aids and tells how they'll benefit you. In addition to these in-text features, supplementary materials such as workbooks, study guides, computer programs, and videos are often available. Reading the introductory material will alert you to the presence of these features and ancillary materials, as you can see from the following example:

To help students understand the various topics, we include several pedagogical features in each chapter. Each chapter opens with a highlighted myth-and-reality question, and ends with a list of definitions of key terms and concepts that have been used in that chapter. We have increased the number of key terms and concepts set off in boldface in the text in this edition. Preview outlines open each chapter and point-by-point summaries appear at the end of each chapter. The conclusion of each chapter provides a retrospective glance at the myths in light of the whole chapter discussion.

³Harvey S. Wiener and Charles Bazerman, *All of Us: A Multicultural Reading Skills Handbook*, 2nd ed. (Boston: Houghton Mifflin, 1995), p. xix.

⁴Jean Pierre Jeannet and Hubert D. Hennessey, *Global Marketing Strategies*, 2nd ed. (Boston: Houghton Mifflin, 1992), p. xix.

An updated chapter-by-chapter listing of suggested readings on topics covered throughout the text appears at the end of the book. And an appendix contains important documents, such as the Declaration of Independence, the Articles of Confederation, the Constitution, Federalist Papers Nos. 10 and 51, and a list of presidents.⁵

Read the Introduction

The introduction is usually well written, because the writer knows that it is the book's show window—especially for prospective customers looking the book over to decide whether to buy it.

Figure 11.1 is a densely packed introduction containing information of great and immediate value for the sharper reading of textbooks. It is from a book titled *Six-Way Paragraphs*.⁶ The book's sole purpose is to teach students how to spot main ideas. One hundred paragraphs are provided for practice. To prepare students for such practice, the introduction strives to explain the ins and outs of the paragraphs found in textbooks. As you read it, be aware not only of *what* the writer says but also of *how* he says it and his *purpose* for saying it.

Preview from Front to Back

After you've read the introductory material, survey the rest of the book. Begin by scanning the table of contents, which lists the parts, the chapters, and sometimes the major headings within each chapter. The table of contents shows the overall organization of the book and how the chapter topics relate to one another. It also shows whether the book contains extra material: appendixes, glossaries, bibliographies or references, and indexes.

Now turn to the back of the book and look at these extra sections. Appendixes contain additional information such as tables and graphs, documents, or details about a specific aspect of a subject. Glossaries are specialized dictionaries of terms common to the subject the book discusses. Bibliographies and references list the sources the authors consulted in writing the book and can point you in the direction of further readings. Indexes—alphabetical listings of significant topics, ideas, and names that appear at the end of text along with page references—give you a sense of the scope of the book and help you locate specific material quickly.

By familiarizing yourself with your textbook, you not only bolster your background knowledge about the subject; you also become aware of the

⁵Gitelson, Dudley, and Dubnick, *American Government*, p. xiv.

⁶Walter Pauk, *Six-Way Paragraphs* (Providence, RI: Jamestown Publishers, 1974).

what: wants you to focus on the paragraph – unit

how: brings you and the writer together

purpose: wants you to look at the paragraph through the eyes of the writer

The paragraph! That's the working-unit of both writer and reader. The writer works hard to put meaning into the paragraph; the reader works hard to take meaning out of it. Though they work at opposite tasks, the work of each is closely related. Actually, to understand better the job of the reader, one must first understand better the job of the writer. So, let us look briefly at the writer's job.

what: each paragraph has but one main idea

how: shows you how a writer thinks

purpose: to convince you to look for only one idea per paragraph because writers follow this rule

To make his meaning clear, a writer knows that he must follow certain basic principles. First, he knows that he must develop only one main idea per paragraph. This principle is so important that he knows it backward, too. He knows that he must not try to develop two main ideas in the same, single paragraph.

what: the topic of the main idea is in the topic sentence, which is usually the first one

how: the writer needs to state a topic sentence to keep his own writing clear and under control

purpose: to instill confidence in you that the topic sentence is an important tool in a writer's kit and convince you it is there, so, look for it!

The next important principle he knows is that the topic of each main idea must be stated in a topic sentence and that such a sentence best serves its function by coming at or near the beginning of its paragraph. He knows, too, that the more clearly he can state the topic of his paragraph in an opening sentence, the more effective he will be in developing a meaningful, well-organized paragraph.

what: developing main ideas through supporting material

how: "more to a writer's job," still keeps you in the writer's shoes

purpose: to announce and advance the new step of supporting materials

Now, there is more to a writer's job than just writing paragraphs consisting of only bare topic sentences and main ideas. The balance of his job deals with *developing* each main idea through the use of supporting material that amplifies and clarifies the main idea and many times makes it more vivid and memorable.

FIGURE 11.1 The Content of an Introduction

Source: Walter Pauk, *Six-Way Paragraphs* (Providence, RI: Jamestown Publishers, 1974), pp. 7–8. Reprinted by permission.

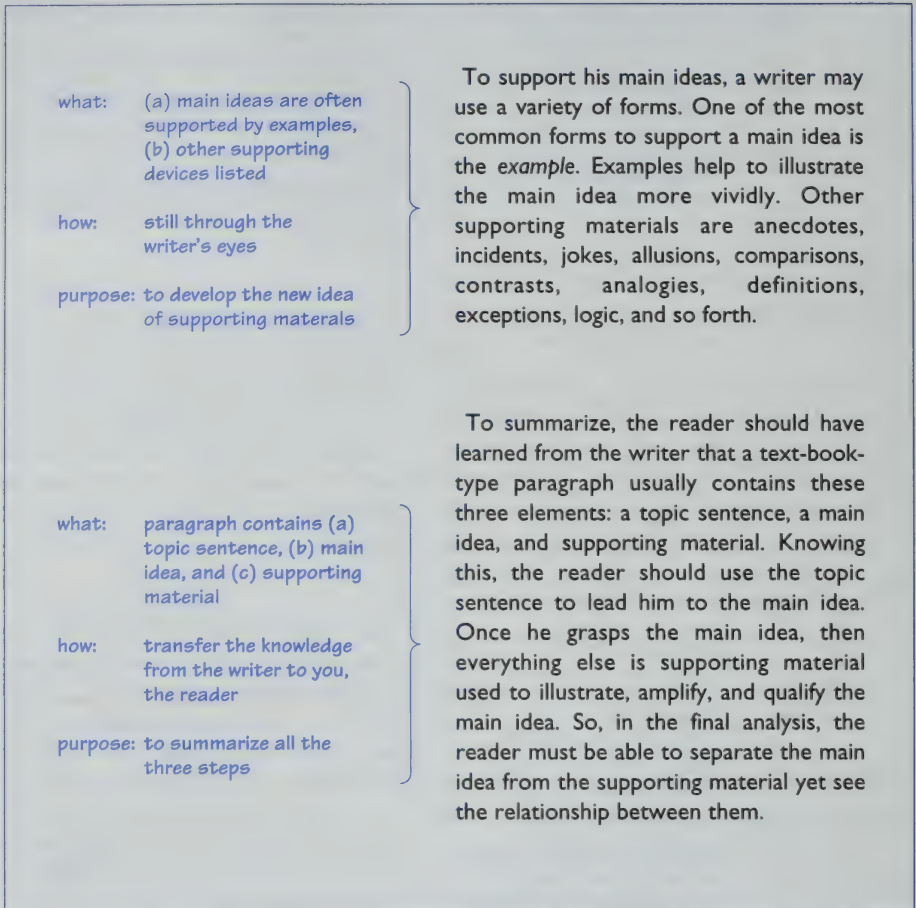


FIGURE 11.1 The Content of an Introduction-continued

features of the book you can use throughout the term. As a result, future assignments will be easier and less time consuming, and you'll have a greater chance to master the material.

Preview Specific Assignments

Previewing specific assignments allows you to overcome inertia, delve into the text, and get a sense of the larger picture into which you can fit specific ideas and facts. When previewing, you can use any or all of the following techniques.

Think About the Title Take a few moments to reflect on the chapter's title. Is its meaning obvious? If not, can you guess what the chapter will discuss?

Read the Introduction and the Summary Although they may not be marked as such, textbook chapters frequently include an introductory paragraph, a brief summary at the end, or both. Reading these sections provides advance organizers, which create a framework on which you can build the information in the chapter.

Look Over Headings and Subheadings Flip through the pages and read the headings. Notice their hierarchy and sequence as you do so.

Take Note of Any Information Set Apart from the Rest of the Text In general, information that is *boxed*, *boldfaced*, *bulleted* (preceded with dots or squares), *screened* (printed on a gray or colored background), or otherwise set apart is information that you don't want to miss. Take a moment to look it over now so you will already be familiar with it when you go back to read the chapter completely.

Glance at the Visuals Pictures and graphic materials can provide a distillation of an entire chapter's ideas in less than a page. The concept maps on the second page of each chapter in this book, for example, show the chapter at a glance. Other visuals supply vivid and easy-to-understand examples of key points.

You may want to limit the amount of time you spend surveying your book. Your primary purpose is to read and understand the chapter. If you spend too much time preparing to read, you'll run out of time and energy for the actual reading. Or as an old Chinese proverb warns, "Keep sharpening your knife and it will grow dull."

Look for Typographical Cues

Open any textbook and you'll quickly discover that the words aren't all printed in the same size or the same style. The format may differ from text to text, but in general each book takes advantage of a variety of type sizes and styles to convey its information. By noting these typographical differences, you can pick up on signals for organization and emphasis.

Boldface (thick, dark type) often signals a textbook heading or subheading. It may also be used to draw your attention to a specific principle, definition, or keyword within the text.

Italics (type that slopes to the right) places emphasis on a word or a phrase.

Underlining often performs the same functions as either boldface or italics, depending on the format of the particular textbook.

- Bullets (small markers, often circular or square) set off the items in lists. Size, color and placement of type often call attention to headings or subheadings. Take note of words printed in larger type, in color, or on lines by themselves.

You can usually crack a book's particular typographical code simply by skimming through your text before you start reading. In addition, look for an explanation of format—especially if it is unconventional—in the book's introductory material.

TALK WITH YOUR TEXTBOOK: AN ACTIVE APPROACH TO LEARNING

Building a foundation for your learning is only the first step to knowledge. The way to make learning *last* is by acting as a full partner in the process. That means talking with your textbook, instead of just receiving its information.

Taking an active approach to reading may mean making a fundamental change in your attitude toward textbooks. Instead of approaching a textbook as a passive recipient of its information, you enter into a dialogue with the thoughts on the page. You do this by listening to what you read, formulating questions as you read, and following other tips for active reading.

Listen to What You Read

The best reading occurs when you use intonation, which is the natural rise and fall of your speaking voice. This doesn't mean reading out loud, but it does mean reading with expression. Intonation helps you combine individual words into meaningful mental "bites."

As your eyes move rapidly across the page as usual, let your mind swing along each line with an intonational rhythm that can be heard by your "inner ear." Read the line expressively. In doing so, you will be supplying the important rhythm, stress, emphasis, and pauses that were taken out when the words were turned into written form. This will put the meaning of the words more quickly within your grasp.

Athens and Sparta / were both Greek cities / and their people / spoke a common language. / In every other respect / they were different. / Athens rose high from the plain. / It was a city / exposed to the fresh breezes / from the sea, / willing to look / at the world / with the eyes / of a happy child. / Sparta, / on the other hand, / was built / at the bottom / of a deep valley, / and used the surrounding mountains / as a barrier / against foreign thought. / Athens / was a city of busy trade. / Sparta / was an armed camp. /

FIGURE 11.2 Using Intonation to Hear What You Read

Source: Reprinted from The Story of Mankind by Henry B. van Loon and Gerard W. van Loon, by permission of Liveright Publishing Corporation. Copyright © 1972 by Henry B. van Loon and Gerard W. van Loon.

To illustrate intonational reading, the passage in Figure 11.2 has been divided into “thought units.” These units are separated by slash marks. (Of course, different readers would group these words into different clusters, depending on individual intonational styles.) You will probably notice how rapidly your eyes move and how easily you comprehend the meaning when you read with intonation.

To make silent intonation a regular habit, take a few minutes to read aloud in the privacy of your room. This will establish your own speech patterns in your mind so you will “hear” them more readily when you read silently.

Formulate Questions as You Read

Reading with intonation enables you to hear the textbook’s authors as you read. You can hold up your end of the conversation by constantly formulating questions as you read, by wondering out loud about issues or aspects that concern you, and by writing out questions that help you pinpoint and remember the most important information. The latter really serves as the foundation for taking notes and mastering them.

Follow Other Tips for Active Reading

Engaging your book in steady conversation is the best way to encourage active reading. But there are some other ways to ensure that you stay on your toes as you move through a textbook assignment.

Relax. Stress can hinder both learning and remembering, the two most important aspects of reading.⁷ Before you begin reading, take a moment to use one of the relaxation techniques recommended in Chapter 3. Optimal learning occurs when you are relaxed. Keep in mind that being relaxed is not the same as being sluggish. A sense of relaxation makes you more, not less, alert and relieves the stress and anxiety that can make learning a chore.

Vary Your Speed as You Read. Match the *speed* of your reading to *what* you are reading. If the chapter starts out with some introductory material, move through that section quickly. When you come to the first substantial paragraph, slow down and start looking for important names, terms, and ideas. These will often serve as keys to the rest of the chapter. Once you're clear on what the chapter is going to cover and how, you can pick up the pace of your reading. But be ready to slow down when you come across a paragraph that's filled with new ideas. There is no reason to expect that you will read at a constant rate.

Focus on the Ideas, Not the Words. Memory research has shown that we remember the gist of what we've read, not the actual words. So if you get bogged down in a difficult sentence, read it through once while skipping any modifying phrases. Find the simple subject of the sentence, the verb, and the simple object to avoid getting lost in a maze of language. (Extend this process to an entire paragraph if necessary.) When the framework of this sentence shows through clearly, so that you can grasp the main idea, then go back and read the material with all its "trimmings" to get the full sense of what's being communicated.

FINDING A TEXTBOOK READING SYSTEM

How do you cope with your textbook assignments? Are they harder to face every day? Does each day's assigned chapter become more difficult to study than the previous one? If you stop to think about the situation, it would seem that with all the practice you get, you'd become better and better at studying your textbook. If this is not the case, you probably need a system or a process that can be used over and over again, in chapter after chapter, and in book after book.

On the other hand, if you have a system, and you are still having a lot of trouble, maybe your grip is all wrong. You know that the first time you

⁷Kenneth L. Higbee, *Your Memory: How It Works and How to Improve It*, 2nd ed. (New York: Prentice-Hall, 1988), pp. 64–65.

pick up a tennis racket you are likely to hold it incorrectly. When this happens, your natural grip causes unnecessary strain and weakens your stroke. Even with practice, you don't improve. So it is with a study system. A wrong one causes strain and weakens your efforts.

Most textbook reading systems are too long, too complicated, and take too much time. Furthermore, a system that is just right for your roommate may not be just right for you. You can tell when a system is the right one for you, because then your work goes along surely and easily and you get better at it day by day.

In this chapter, I'm going to present a novel approach for mastering a textbook. It has worked extremely well with the new generation of Cornell freshmen. But before I present this new system, let us start off with the venerable SQ3R System.

THE SQ3R SYSTEM

The SQ3R System (see Figure 11.3) was devised during World War II by Francis P. Robinson, an Ohio State University psychologist. The system was designed to help military personnel enrolled in special programs at the university read faster and study better.

Robinson's imaginative, acronymic formula, SQ3R, compresses into one "word" five steps for mastering a textbook. The first step is "S," which stands for *Survey*; that is, Robinson urges students to leaf through an assigned chapter reading headings and subheadings, skimming topic sentences, and reading summary and concluding paragraphs. This initial overviewing provides students with *advance organizers*,⁸ which help to make subsequent reading and learning easier.

The second step is "Q," which stands for *Question*; that is, turning headings and subheadings into questions by preceding them with *who*, *what*, *when*, *where*, or *how*. These types of questions help to focus a reader's concentration.

The third step is "R₁," which stands for *Read*. After a question is framed, students read the ensuing paragraph or section to answer the specific question.

The fourth step is "R₂," which stands for *Recite*. Immediately after reading, students should look away from the page and recite what they have just read in their own words.

The fifth step is "R₃," which stands for *Review*. After finishing the chapter, students are instructed to go back to the beginning of the chapter,

⁸John F. Wakefield, *Educational Psychology* (Boston: Houghton Mifflin, 1996), p. 398.

THE SQ3R SYSTEM

S SURVEY

Glance through all the headings in the chapter, and read the final summary paragraph (if the chapter has one). This survey should not take more than a minute, and it will show you the three to six core ideas on which the discussion will be based. This orientation will help you organize the ideas as you read them later.

Q QUESTION

Now begin to work. Turn the first heading into a question. This will arouse your curiosity and thereby increase comprehension. It will bring to mind information you already know, thus helping you understand that section more quickly. The question also will make important points stand out from explanatory details. You can turn a heading into a question as you read the heading, but it demands conscious effort on your part.

R₁ READ

Read the paragraph or section to answer the question. Read activity.

R₂ RECITE

After you finish reading the paragraph or section, stop, look away from the book, and try to recite the answer to your formed question. If you cannot recite the answer correctly or fully, reread the section and try again.

R₃ REVIEW

When you have finished reading and reciting page after page, go back to the beginning of the chapter, glance at the headings and subheadings, and think briefly about the answers that you have already recited. Work your way in this manner to the end of the chapter. Now you should have ended with an integrated bird's-eye view of the entire chapter.

FIGURE 11.3 The SQ3R System

Source: Adaptation of "Steps in the SQ3R Method" (pp.32–33) from *Effective Study*, 4th Edition, by Francis P. Robinson. Copyright 1941, 1946 by Harper & Row, Publishers Inc. Copyright © 1961, 1970 by Francis P. Robinson. Reprinted by permission of the publisher.

glance at each heading, and mentally note the contents, ending up with a bird's-eye view of the chapter.

SQ3R is a popular system. Although widely accepted, even SQ3R has its drawbacks. For example, it applies only to textbook assignments, it offers no guidelines for mastering lectures, and it does not use the reflection step. Despite these shortcomings, SQ3R was a valuable breakthrough in learning techniques. It demonstrated clearly that the process of mastering information could be expressed in a concrete step-by-step system.

THE QUESTIONS-IN-THE-MARGIN SYSTEM

Though the Questions-in-the-Margin System, for purposes of instruction, is explained in seven steps, the system actually revolves around just one principal step; that is, the formulating of a question for the main idea in each paragraph. Once the question has been formulated, the rest of the steps fall in place naturally.

Employing questions provides the most effective means of activating information in a textbook chapter and bringing it to life. Without questions, even the most exciting textbook material runs the risk of remaining inert. Asking questions turns students into active readers.

The Questions-in-the-Margin System draws its questions directly from textbook paragraphs instead of from chapter headings. A textbook paragraph, after all, adheres to at least one standard. Every one contains a main idea. If you look at it another way, every paragraph provides the answer to an unasked question. Find that question and you will have found a way of getting to the heart of the paragraph. This is the simple principle behind the Questions-in-the-Margin System.

To see how well the system enhances the comprehension, learning, and remembering processes, read the seven steps in Figure 11.4. When you finish the seventh step, you will feel as though you have put the last piece of a jigsaw puzzle in place: You will see the full picture, which will imprint itself indelibly in your memory.

Step 1: Surveying a Textbook Chapter

Surveying has various uses, but its greatest use is in mastering textbook assignments. It is the grease that makes subsequent reading and studying more efficient. A good scholar would no more begin reading a chapter without first skimming it than an automotive engineer would run a car

SURVEY	Read the title and speculate about what the chapter will be about. Read the headings to determine what ideas and facts will be presented. Read any summarizing section.
QUESTION	Turn each heading into a question by adding such words as "what," "how," or "who." Then read to answer the question.
READ	Read several paragraphs; then come back to the first paragraph and ask questions such as these: What is the main idea? How do the supporting materials support it? What do I need to know in this paragraph?
QUESTIONS IN MARGINS	Think deeply; then formulate and write a brief, telegraphic question in the margin. Next, underline very sparingly only the key words and phrases that make up the answer. The less underlining, the better.
RECITE	Counteract forgetting by reciting. Cover your textbook page, exposing only your questions in the margin. Then, in your own words, recite aloud the answers. After reciting, check for accuracy. Recite until you've completed the chapter.
REVIEW	Immediately after reciting, take a fresh look at each question; mentally glimpse and hold the answer for a few moments. In this way, work through the entire chapter. This overview of questions and answers will tend to snap the separate parts together like pieces of a jigsaw puzzle, enabling you to see the chapter as a whole. Intersperse reviews throughout the semester.
REFLECT	Manipulate the ideas and facts mentally. Turn them over, speculate on them, compare one with the other, notice where they agree and differ. Organize them under larger categories, or compress them into smaller units. Finally, free them from the chapter by weaving them into your existing knowledge.

FIGURE 11.4 The Questions-in-the-Margin System

Source: "The SQ3R Method" from *Effective Study, Fourth Edition* by Francis P. Robinson. Copyright © 1961, 1970 by Francis P. Robinson. Copyright 1941, 1946 by Harper & Row Publishers, Inc. Adapted by permission of HarperCollins Publishers.

without first greasing it. The grease does not supply the power, but without it the gasoline would not be of much use.

If you skip this step, you will lose time, not save time. If you burrow directly into one paragraph after another, you'll be unearthing one compartmentalized fact after another, but you won't see how the facts relate to each other. Psychologists call this not-seeing-the-big-picture condition *tunnel vision*.

Here is how a student who had developed the technique of surveying to a fine art described this step:

I first spend two or three minutes trying to get the full meaning out of the title of the chapter. I even wonder briefly why the author picked such a title. Then I shove off by saying to myself, "Let's see what he has to say about this subject."

Next, I read the first couple of paragraphs in the regular way. If I don't do this, it's like coming into the middle of a conversation: I can't make head or tail of it.

Then I let the printer guide me. My eyes dart to the big-type headings and subheadings. I read them because I know that they are like the small headlines for newspaper items. They are little summaries. I then read a sentence or two underneath these headings. My eyes float over the rest of the material looking for other islands of information. They might be marked by clues such as italicized words, underlined words, and changes in the type.

When I first started to skim, I used to skip all the illustrations, charts, and diagrams. But after getting burned on exams, I found I could learn a lot very easily just by reading the captions and noticing what the lines on the diagrams and graphs meant. At least for me, illustrations stick in my mind better than words do; so during an exam, I take advantage of this. I close my eyes and see the illustration on the blackboard of my mind.

I'm always careful to read the last paragraph or last section marked "summary." That's where the author gathers together all the main ideas of the chapter.

Finally, I pause for a few minutes to bring all these pieces and fragments together before I begin reading and taking notes on the chapter. Sometimes to bring things together, I go back to the beginning of the chapter and leaf through the pages without reading, just looking at what I have already looked at.

There are a few other things that skimming does for me. First, I no longer put off studying. Skimming is easy, so I don't mind getting started. Second, once I get into the chapter, I find that most of the chapters contain some interesting information, so I become interested. Third, because I am interested in the material, I concentrate better. And fourth, the topics that I find by skimming somehow make good topic headings for my notes.

When you skim, don't dawdle. Move along with good comprehension, but go slowly enough to get the facts, ideas, and principles accurately. Once assimilated, a mistake is hard to eradicate.

There are four practical reasons why surveying can make a real and immediate difference in your reading.

1. *Surveying creates a background.* When you don't have some prior knowledge about the subject matter of an assigned chapter, you read slowly and have difficulty understanding the material. When you come to something that you recognize, your reading speed quickens and your comprehension grows. The difference is your prior knowledge. Surveying prepares you for reading by giving you some background information about a chapter. Surveying counteracts tunnel vision. Once you have viewed the broad canvas, you will see how individual ideas fit into the complete picture.

When you skim a chapter, you spot and pick up topics by reading headings and subheadings. You pick up ideas by reading the first and last sentences of paragraphs. You become familiar with the names of people and places by skimming these names. You grasp the general objective of the chapter by reading the introductory paragraph, and you get an overview by reading the summarizing paragraph at the end of the chapter. You won't know any of these facts and ideas cold, of course. But when you encounter them again during your careful reading, you will recognize them, and this familiarity will give you confidence and understanding.

2. *Surveying provides advance organizers.* According to David P. Ausubel,⁹ a learning-theory psychologist, a preview of the general content of a chapter creates *advance organizers*, which help students learn and remember material they later study closely. The familiar landmarks act as topics or categories under which ideas, facts, and details may be clustered. John Livingston Lowes, a professor of literature at Princeton University, characterized such familiar landmarks as *magnetic centers* around which ideas, facts, and details cluster like iron filings around a magnet.

George Katona, a psychologist, tested the effectiveness of advance organizers with two groups of students. One group was asked to read a selection in which a general principle of economics was stated in the first sentence. The second group was given the same selection, but with the first sentence deleted. When the students in the first group were tested, they not only remembered the specific content of the paragraph better than the second group, but they were able to apply the general principle to all the examples in the selection. Without the first sentence, which was an advance organizer, students in the second group viewed the examples as separate, unrelated entities and were unable to see that those examples could be clustered under the one umbrella of a common principle in economics.

3. *Surveying limbers the mind.* For an athlete, a pregame warm-up limbers muscles, and it also limbers the psyche and brain. An athlete knows that success comes from the coordination of smoothly gliding muscles, a positive attitude, and a concentrating mind. The prestudy survey of a textbook achieves for the scholar what the pregame warm-up achieves for the athlete.

4. *Surveying overcomes mental inertia.* How often have you said with impatience and exasperation, "Let's get started!" Getting started is hard. According to Newton's first law of motion, "A body in motion tends to remain in motion; a body at rest tends to remain at rest."

⁹Wakefield, *Educational Psychology*, p. 368.

Many students find it difficult to open a textbook and begin to study. If you are one of them, use surveying to ease yourself into studying. Surveying does the job: It gets you started.

You need not always survey an entire chapter as the first step. You may begin by surveying the first part before you read it. Later, as you work your way through the chapter, you may want to skim further ahead, page by page, as you read and study to understand.

Step 2: Turning Headings into Questions

The people who have *answers to give* when they are finished reading are usually those who had *questions to ask* before and during their reading. Asking questions works for one main reason: The questions force you to concentrate and to observe the words keenly, directly, and selectively as you read. When you don't have a question in mind, your eyes just glide over a paragraph, and you never realize that the printed words are alive with answers. In the words of writer John Lubbock (1834–1913), "What we see depends mainly on what we look for."

As you read, you should interrogate the writer, not simply stare at the words. You must approach each paragraph like an inquiring reporter, with definite and searching questions. The better your questions, the better will be your comprehension.

How do you formulate warm-up questions as you read and study a textbook? One technique is to turn each heading into a question. For example, the main heading "Basic Aspects of Memory" could be turned into the question "What are the basic aspects of memory?" The technique is simple, but it works. Here are some additional examples:

<i>Subtopic Heading</i>	<i>Question Formulated</i>
The Memory Trace	What is a memory trace?
Rate of Forgetting	How fast do we forget?
Organization of Recall	How is recall organized?
Decay Theory	What is the decay theory?

Once you have turned a heading into a question, you read the material under the heading to answer your question. If the question is answered early in the discussion, ask another, based on what you have read.

There are general questions that you can use in reading about almost any topic. Some readers prefer to ask these general questions to uncover

specific facts and ideas. Other readers just enjoy conversing with the writer through the use of a general question-and-answer technique. In either case, an active, searching attitude is created. Here are some of the general questions:

- What does this paragraph tell me?
- What are the important supporting details?
- Does this example make the main point clear?
- What evidence does the writer give?
- What is the underlying principle?
- If this fact or idea is true, then what logically follows?
- If it is true, how does it affect my existing knowledge?
- How does this paragraph fit in with this chapter?
- What questions might I be asked about this paragraph?

Some practical readers ask not only “What is the author saying?” but also “How can I use this information?” If you ask such questions, make it a rule to try to answer them. Say something. Say anything that makes sense to you. Without effort, there’s no gain.

A great deal is said these days about learning how to think: Books are written, lectures are given, and teachers exhort. The subject of thinking can be summarized in this one line: Thinking at its highest level is asking the right, relevant question.

Step 3: Reading Paragraph by Paragraph

After surveying the chapter, return to the first paragraph and read it thoroughly enough to answer only one question: What did the author say in this paragraph? If you are unable to answer this question at first, you must reread the paragraph until you can; otherwise you will not gain a functional understanding of the paragraph.

This is a crucial step. You must not move ahead to succeeding paragraphs if doing so means leaving the present paragraph unsettled. You may push on beyond a problem paragraph for the purpose of gaining context, but always with the intention of coming back to the problem paragraph. Remember that understanding a succession of paragraphs leads to comprehension of the chapter.

Guard against the habit of moving your eyes over the lines of print without grasping the writer’s ideas. Read for the ideas and concepts behind

the words. Pause at the end of each paragraph or at the end of a series of paragraphs, and in your own words describe the writer's main idea and the supporting details. Answer the question "What did I learn in this paragraph?" When you have described, you have understood.

The Topic Sentence Use the topic sentence to help yourself break into the meaning of each paragraph. The topic sentence often contains the main idea or points to the main idea.

In Figure 11.5, the first sentence, the topic sentence, states the main idea. The rest of the paragraph is a long list of concrete examples supporting the main idea. The last sentence is not a continuation of the list; it rounds out or completes the paragraph. Incidentally (but importantly), notice how the writer sustains the mood of despondency from the opening sentence, through the examples, into the last clause of the last sentence.

Textbook Troubleshooting As you read and study your textbook, your businesslike side should keep asking, "Am I getting it?" If the answer is, "It's getting pretty vague," you should take immediate action:

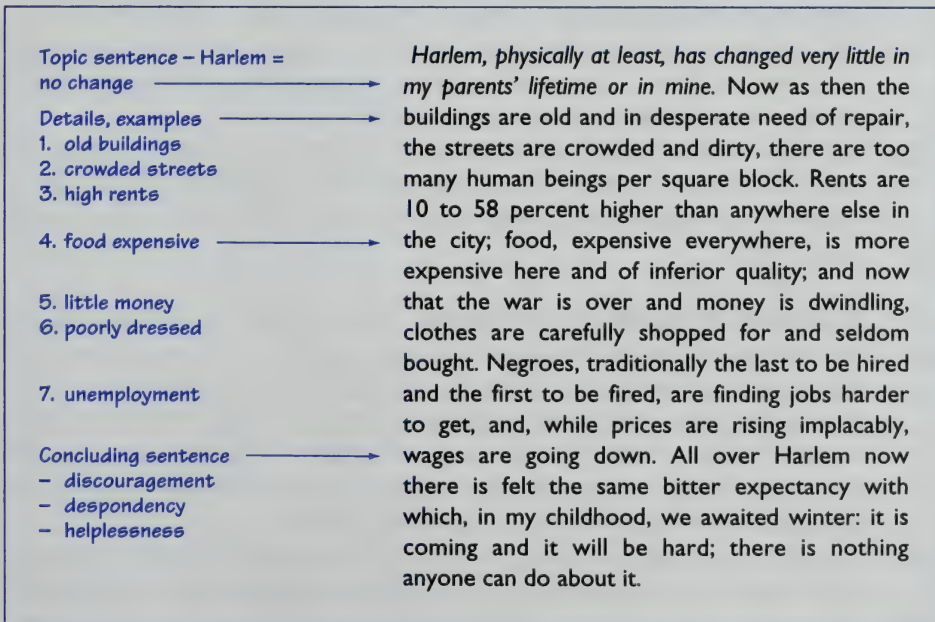


FIGURE 11.5 The Topic Sentence

Source: James Baldwin, *Notes of a Native Son* (Boston: Beacon Press, 1990), p. 57.

1. Go back a couple of paragraphs to pick up the thread of the writer's ideas again.
2. Read ahead a couple of paragraphs to see where you're going.
3. Open your dictionary and look up any words that you are not sure of and that might be holding you back.
4. Reread the troublesome paragraph aloud, using exaggerated expression and emphasis to get at the meaning of what's being said. Such reading aloud, especially with expression, brings concentration back to a 100 percent level.

The Backdoor Technique While dean of the Cornell University College of Engineering, Dale Corson once observed that engineers and other students in science and mathematics must often crack the meaning of an idea or concept one sentence at a time. If comprehension does not occur even at this snail's pace, then you must ask your instructor for help. "But before you do," says Dr. Corson, "ask yourself this question: What is it that I don't understand?"

Under no circumstance should you go to the instructor, open the book, and with a broad sweep of your hand say, "I don't understand this." When you go for help, you should be able to say, "I understand and follow the writer's idea up to this point and even beyond this point, but for some reason this particular section has no meaning for me." That way, the instructor knows not only what you understand and don't understand but also that you did your utmost to achieve understanding. You now have set the stage for a meaningful learning session.¹⁰

The Backdoor Technique has a wonderful by-product. After analyzing and verbalizing your problem, after viewing it from several angles, you will most likely have solved it yourself. You may not have to discuss it with anyone else.

Additional Reading Strategies When you read sentences, make full use of signal words and organizational clues. If a sentence or paragraph begins *on the one hand*, watch for the inevitable *on the other hand*, which introduces the other side of the argument. Innocent little everyday words such as *since*, *because*, and *although* are as important in relating parts of a sentence as a plus, minus, or square-root sign is in a math equation. Ignoring or misreading them can get you into serious trouble.

After you finish a paragraph and summarize it, don't plunge immediately into the next paragraph. Pause for a minute or two, to think about the

¹⁰ This technique was revealed to the author in a personal conversation with Dr. Corson, who later became Cornell's president.

meaning of the paragraph you just read. Such a thinking pause provides time for the main idea to consolidate, to sink into your memory.

Whenever you encounter a difficult, unusual, or new word or term in your textbook, look it up in a glossary or dictionary. Put these words and terms, with their definitions, on 3×5 cards. You can learn these words and terms by carrying the cards and looking them over whenever you have a chance.

When you feel bored, do not reward your boredom by slamming your book shut and leaving empty-minded. Above all, don't reward yourself by going to a movie. If you get bored, give yourself the limited objective of extracting one nugget of knowledge, be it ever so small. Then, with that *accomplished*, you have *earned* the right to a break or a movie.

Step 4: Writing Questions in the Margin

The question-in-the-margin step is different in purpose from the question step of the SQ3R method. In the SQ3R method, the purpose of the question is to keep the reader alert, concentrating, and looking for an answer to the limited question that was asked. The question step of SQ3R directs the reader to turn headings and subheadings into questions. Obviously, putting *what* or *how* in front of a heading does not transform it automatically into a deep and searching question. A heading that is limited to begin with will remain limited after the addition of *what* or *how*.

To be sure, this does not mean that the question step in SQ3R is not a good one. It serves a definite and valuable purpose when you are reading paragraphs or sections of the textbook for the first time. However, it is hard to imagine that you will be able to formulate a provocative question on textbook material before you have read, understood, and thought about the material. Merely asking a question before reading does not in any way guarantee that an answer will be forthcoming, regardless of how hard you read. Coming up with answers is not easy. Usually you have to dig hard for a comprehensive, accurate answer, and that is why the question-in-the-margin step comes into the system at this time—after you have read a paragraph thoroughly.

Once you have read a paragraph thoroughly and have been able to answer questions such as "What is the main idea here?" or "What are the important points made here?" you are ready to formulate and write a brief, telegraphic question in the margin of your textbook. After writing the question, you should then, for the first time, underline very sparingly only the keywords and key phrases that make up the answer. The less underlining you do, the better (see Chapter 12 for a detailed discussion of making notes

in your textbook). Later, when you review for an exam, your eyes and mind will be directed to the words and phrases that deliver the meaning directly and efficiently. When you underline only the keywords and key phrases, you have to think, and thinking is what makes understanding and remembering possible.

Go through the entire chapter in this way: reading thoroughly to understand the passage; writing a brief, meaningful question; and underlining sparingly. Figure 11.6 shows the questions-in-the-margin technique applied to a textbook page.

Step 5: Reciting Based on the Questions in the Margin

After formulating questions on the entire chapter, go back to the beginning of the chapter and cover the printed text with a blank sheet of paper, exposing only the questions you've written in the margin. Read the first ques-

WRITING GOOD PAPERS IN COLLEGE

What 2
aspects lead
to success?

What 3
elements
might make
up a paper?

What's the
key in choosing
a topic?

If not sure
of a topic,
do what?

The techniques of writing a good paper are easy to follow. You should remember two important aspects that lead to success. First, start work early on the paper. Second, if you have a choice, choose a subject that you are interested in or that you can develop an interest in.

Much of your work in college involves absorbing knowledge; when it comes to writing papers, you have the opportunity to put down on paper what you've learned about a subject, and perhaps your opinions and conclusions on the subject.

Writing is an important form of communication. To communicate well you must have something you really want to say. So if you have a choice of topics, choose one that intrigues you. If it isn't one that everyone else is writing on, all the better. If you're not sure about your choice of topic, do a little preliminary research to see what's involved in several topics before you make a final decision. Remember the caution about allowing yourself enough time? Here's where it comes into play. Take enough time to choose a topic carefully.

FIGURE 11.6 Writing Questions in the Margin

tion aloud, and answer the question in your own words. Slide the blank sheet down to check your answer. If your answer is wrong or incomplete, recite it aloud again. Do this until you get the answer right. Go through the entire chapter in this way. Your aim is to establish in your memory an accurate, crystal-clear impression, because that's what you want to return to later during an exam. If the impression in your memory is fuzzy at this time, it will be even fuzzier three or four weeks later. (See Chapter 5.)

Why Recite Aloud? Reciting aloud forces you to think, and it is this thinking that leaves behind in your memory a neural trace to come back to. Forgetting never lets up. It works continuously to expel from memory what you worked so hard—often far into the night—to put there. Don't let forgetting get the upper hand. You can bring forgetting almost to a standstill by using the power of recitation.

Reciting promotes concentration, forms a sound basis for understanding the next paragraph or the next chapter, provides time for the memory trace to consolidate, ensures that facts and ideas are remembered accurately, and provides immediate feedback on how you're doing (and when you know that you're doing well, you will make progress). Moreover, experiments have shown that the greater the proportion of reciting time to reading time, the greater the learning. Students who spent 20 percent of their time reading and 80 percent reciting did much better than students who spent less time reciting and more time reading.

When you recite aloud, don't mumble. Express the ideas in complete sentences, using the proper signal words. For example, when you are reciting a list of ideas or facts, enumerate them by saying *first*, *second*, and so on. Insert words such as *furthermore*, *however*, and *finally*. When you do so in oral practice, you will do so more naturally in writing during an exam.

Another Way: Reciting and Visualizing Visualizing is a powerful technique for increasing your learning and your remembering. As you recite, instead of just mouthing the answer, picture yourself as a scholar-ator standing by your seat in the classroom reciting your answer to the instructor. Although you are actually sitting at your desk in your room and reciting in a lively manner, in your mind's eye you are standing in the classroom speaking, explaining, and gesturing.

Many successful athletes use visualization all the time. They burn such a positive image into their minds that it becomes part of the subconscious, and they expect the performance that they visualized to be carried out in actuality. Dwight Stones, a former U.S. Olympic high jumper, is very well known for the way in which he visualizes each jump before he actually makes it. There's nothing subtle about Stones. As he stands staring at the bar, his head

bobs and you can almost visualize his jump yourself. His little routine might almost be comical except for one thing: Stones has won countless gold medals in international competition, so instead of being laughed at for his peculiar routine, he is widely imitated by younger athletes who literally and figuratively are hoping to reach the heights that Stones has achieved.

Picture yourself in a classroom writing the answer to an essay question. Visualize the entire scene: the classroom, the other students, the instructor, the exam being handed out, your reading the questions. Now look at your textbook; read the question in the margin aloud; think for a few moments about how you plan to organize and deliver your answer. Then, as if you were in an exam, recite softly to yourself and at the same time write your answer as you would if the exam were real. Try to *see* yourself in the classroom, thinking and writing forcefully and successfully. In this way you'll be creating in your brain cells a deep, well-defined pattern that will be easy to come back to and follow when the real exam is given. In Chapter 13, you will learn more about how to think visually.

Step 6: Reviewing Immediately and Later

Immediately after you have recited the whole chapter, you should finish the session with a general, relaxed overview, using the questions in the margins as cues. The purpose of the general overview is to put together all the separate questions and answers—to snap them together like the parts of a jigsaw puzzle and reveal the chapter as a whole.

This overview is to be created not by reciting the whole business over again—you've had enough of that for a while. Rather, look thoughtfully at each question in the margin, mentally glimpse the answer, and hold the answer in mind for a few seconds. Proceed through the entire chapter in this way. Don't make this process a chore. Actually, it could be a pleasant process, similar to taking a sweeping glance at a lawn you've finished mowing or a room you've straightened up. Take a last mental look at the questions and answers, and try to see the chapter as a whole.

The immediate review is important—very important—but it is not enough. You should review thoroughly and often. Later reviews should be conducted in the same way as the immediate review: using questions in the margins as cues, one page at a time, aloud, and in your own words. These later reviews will keep you in a state of preparedness for quizzes and exams. You won't need to cram your head full of ideas and facts the night before an exam. All you'll need is a refresher, in the same form—one more review.

As you review, look for ways to connect or categorize, to put like things together and to place opposite things opposite each other. Look for common characteristics, differences, or functions by which to categorize facts

and ideas. This type of analysis puts you in control and gives you the chance to use your creativity—to bring the textbook to life and bring order to the mass of information you are required to learn. Categorizing also puts to practical use the theory of the magical number seven, described in Chapter 5—the finding that the immediate memory seems to be limited to seven categories, which can be as broad as you care to make them.

The best time for a fast review of your textbook is the half-hour before going to bed. Things learned then have a way of lingering in the conscious mind during the time before sleep comes and in the subconscious mind after sleep comes.

Step 7: Reflecting on Facts and Ideas

After you learn facts and ideas through recitation and immediate review, let your mind reflect on them. Let it speculate or play with the knowledge you've acquired. To engage in reflection is to bring creativity to your learning. Ask yourself such questions as these: What is the significance of these facts and ideas? What principle or principles are they based on? What else could they be applied to? How do they fit in with what I already know? From these facts and ideas, what else can I learn? When you reflect, you weave new facts and ideas into your existing knowledge. They then become part of your regular stock of thinking tools.

There's a huge difference between proficiency and creativity. You can become proficient by studying your textbooks and lecture notes, but you will never be creative until you try to see beyond the facts, to leap mentally beyond the given. You must reflect on the facts and ideas, because creativity comes only through reflection, not from recitation and review.

To survive academically in college, you have to recite. To grow in creativity and in wisdom, you have to reflect.

The Reciter . . .

- Follows strictly the ideas and facts in the textbook
- Is bound by the course outline
- Is diligent and disciplined in memorizing but keeps ideas and facts at arm's length

The Reflector . . .

- Pursues ideas and facts through additional reading in the library and goes to original works
- Uses the course outline as a point of departure
- Is adventurous and experimental and internalizes facts and ideas

The Reciter . . .

- Is so busy reciting that the framework of the course is vaguely seen or missed
- Understands the literal meaning but not the implications of assignments
- Learns and accepts facts and ideas in the sequential order of the textbook

The Reflector . . .

- Is likely to see the framework of the course and to talk to the instructor because of ideas occurring during reflection
- Applies learning to various situations
- Thinks, hypothesizes, speculates, and then tests ideas independently

Begin with the facts and ideas you have learned, and become curious about them. Look at them in different ways, combine them, separate them into the basics, try to find out what would happen if the opposite were true, and so on. This may be difficult at first, but it will become easier as your creativity grows. Continue your reflection until your ideas take definite shape. Don't leave them vague. If you need more information, an encyclopedia or a standard source book on the subject will often help you bring fuzzy ideas into focus.

The only type of learning that becomes a permanent part of you and increases your innate wisdom is *advantageous learning*—learning that occurs when you take a voluntary, extra step beyond the mere memorization of facts. That extra step is reflection.

SUMMARY

What's the best way to get the semester off to a good start?

Buy Books right after registered time to read important things

What is meant by "talking with your textbook"?

converse like hearing it awareness of how it talks to you

What does the introductory material reveal?

introduce author's objective book is organized different from others

Buy all your books just as soon as you've registered, so that you will have time to read the table of contents, preface, introduction, and other up-front material in each textbook.

Reading a textbook should be like engaging in a conversation: You should listen carefully to a passage in your textbook, becoming aware of its intonation, the rises and falls in the words you would hear if the sentences were spoken.

In the preface, for example, you might find the author's objective, how the book is or-

author's qualifications underlying principles on same sub.

Questions-in-the-margin System
Directly from contents of
the book

What is the main value of the SQ3R method of study?

5 steps: systematically
1. survey 4. Recite
2. Question 5. Review
3. Read

In what way is the Questions-in-the-Margin System different from the SQ3R method?

Why might a question from the Questions-in-the-Margin method be a better tool?

Read and ask, what
is the main idea

Why recite?

Forces thinking
hearing
listening for remembering

Why do an immediate review?

Why reflect?

To see what you
can learn (questioning it)
to create ideas

ganized, how and why the book is different from other books on the same subject, and the author's qualifications for writing the book. From the introduction, you might learn the underlying principles of the book.

It helps you to approach reading assignments systematically. It takes you through the five steps of survey, question, read, recite, and review, thus leading you to better understanding and better retention of facts and ideas.

In the SQ3R method, the question is formulated from the chapter headings and subheadings, whereas the Questions-in-the-Margin System draws its questions directly from the contents of each textbook paragraph.

In the SQ3R method, the question formulation is almost a nonthinking routine; that is, you simply put a *who*, *what*, *when*, or *how* in front of a caption that is often quite general; but in the Questions-in-the-Margin System you have to read the paragraph and then ask yourself, What is the main idea of this paragraph?

If you want to remember information, there is no single more powerful technique than reciting. Reciting out loud forces you to think while you recite; also, you hear your own words, thus using listening for remembering.

Formulating the "big picture" improves the likelihood that the facts from the chapter will remain in your memory.

Reflecting is an added dimension. You begin the process by questioning the things you learn. Wonder about their significance, the principles on which they are based, and other ideas they might be applied to. In short, try to see beyond the facts and ideas in the pages of your textbooks.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Frequent and thorough reviews help to eliminate the need for _____.
recitation cramming reflection *cramming*
2. When you use the Questions-in-the-Margin System, you should underline the textbook _____.
sparingly frequently initially *sparingly*
3. Learning is most likely to occur when the proportion of reciting time to reading time is _____.
high equal low *equal*

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------------------|--|
| _____ 1. Reflection | a. Time-honored way to study textbooks |
| _____ 2. Surveying | b. Pinpoints what you don't understand |
| _____ 3. Recitation | c. Reveals author's objectives |
| <i>f</i> _____ 4. Intonation | d. Brings creativity to learning |
| <i>f</i> _____ 5. Preface | e. Replaces the rhythm, stress, emphasis, and expression often lost in writing |
| <i>h</i> _____ 6. SQ3R System | f. Serves as a preview for what's to come in the book |
| _____ 7. Backdoor Technique | g. A powerful weapon for combating forgetting |
| <i>d</i> _____ 8. Visualization | h. Adds a new dimension to the learning process |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- F* _____ 1. The first few pages of a textbook should usually be skipped.
- F* _____ 2. Textbook reading gives you a chance to hold a continuing conversation with the author.
- F* _____ 3. Surveying a chapter provides advance organizers.
- F* _____ 4. Visualization will weaken the power of recitation.
- T* _____ 5. Answers to questions in the margin may be written as well as recited.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. The introductory material in a textbook does *not* include
 - a. the book's purpose.
 - b. the author's credentials.
 - c. the book's organization.
 - d. the course's objective.
2. The value of surveying your textbook is that it
 - a. allows you merely to skim your reading assignments.
 - b. motivates you to do additional reading on the subject.
 - c. allows you to find the answers at the back of the book.
 - d. bolsters your knowledge of the subject.
3. Reading with intonation means reading with
 - a. a partner.
 - b. a loud voice.
 - c. expression.
 - d. apprehension.
4. The Questions-in-the-Margin System ultimately aids your mind's ability to
 - a. recall.
 - b. recognize.
 - c. reflect.
 - d. rephrase.

Short answer. Supply a brief answer for each of the following items.

1. What are the advantages of buying your textbooks well before classes begin?
2. Why and how is "talking with your textbook" a good idea?
3. What are the five steps of the SQ3R System?
4. Basically, how does the Questions-in-the-Margin System differ from the SQ3R System?
5. Why does the Backdoor Technique work?

THE WORD HISTORY SYSTEM

candidate can'-di-date' *n.* 1. A person seeking an office, prize, or honor. 2. One likely to gain a position or come to a certain fate.

Candidate *originally, one clothed in white*



In Latin *candidus* means “glittering,” “white.” In ancient Rome, a man campaigning for office wore a white toga and was consequently called *candidatus*, “clothed in white.” From this comes our word *candidate* with the meaning “one campaigning for office”—but without the original significance as to dress. From the same Latin word *candidus* we have our adjective *candid*. This word was first used in English with its literal meaning “white” but is now applied figuratively to a mental quality unclouded by dissimulation or bias.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

General Norman Schwarzkopf, head of coalition troops in the 1991 Persian Gulf War, thought very little of the military *acumen* of his *adversary*, Saddam Hussein.

—Louis E. Boone, author *Quotable Business*

- | | | | |
|---------------------------|------------|----------|-----------|
| 1. military <i>acumen</i> | leadership | keenness | precision |
| 2. his <i>adversary</i> | enemy | peer | aggressor |

Doesn't it seem some days as though other people were put in the world for no other reason than to *aggravate* you?

—Ed Howe (1853–1937), American journalist

- | | | | |
|----------------------------|-------|--------|-------|
| 3. to <i>aggravate</i> you | annoy | injure | alarm |
|----------------------------|-------|--------|-------|

The *proletarians* have nothing to lose but their chains.

—Karl Marx (1818–1883) and Friedrich Engels (1820–1895), German political philosophers

- | | | | |
|----------------------------|---------|--------|---------------|
| 4. the <i>proletarians</i> | victims | slaves | working class |
|----------------------------|---------|--------|---------------|



NOTING WHAT'S IMPORTANT IN READINGS

To read a book, to think it over, and to write out notes is a useful exercise; a book which will not repay some hard thought is not worth publishing.

—MARIA MITCHELL (1818–1889), ASTRONOMER

Note-taking strategies differ dramatically. When it comes to textbook assignments, some students cover each page with brightly colored ink from a highlighter pen. Other students are more cautious, marking a textbook so sparingly that from a distance the pages still seem pristine.

Which approach is the better one? Or perhaps they're both right. Or they're both wrong. One thing is certain: To remember important ideas, you must make written notes.

This chapter proposes a sensible, systematic note-taking method for textbook reading. It provides guidelines for:

- Building on what you already know
- Using the Standard System
- Using the Questions-in-the-Margin System
- Using the Separate Notes System
- Reading and taking notes on supplemental material
- Using your notes
- Combining textbook and lecture notes

NOTING WHAT'S IMPORTANT IN READING

**Building
on What
You Already
Know**

Using the
Syllabus

Skimming,
Surveying, and
Previewing

**The
Standard
System**

Underlining

Marking in
Text and
Margins

**The
Questions-
in-the-Margin
System**

Questions-
in-the-Margin

How to
Mark Your
Text

**The Separate
Notes
System**

Using
Keyword
System

Writing
Paragraphs

**Notes on
Material**

Outside
Readings

**Using Your
Notes**

Use
Summarizing
System

**Combining
Textbook
and Lecture
Notes**

Use Special
Format

About one-half the information you are exposed to in a college-level course comes from textbooks. Your purpose in reading is to get to the point of what has been written. It's rare that the essence of an entire chapter will be squeezed into a single sentence. Instead, you will more likely be introduced to a series of key ideas, important points, or principles that, when pieced together, will solve the puzzle of what the author is trying to convey.

Not surprisingly, therefore, when reading an assignment you should focus your attention on ferreting out key ideas. In general, the most successful students are those who are able to track down these all-important key ideas. Luckily, the process is far more methodical than mysterious.

First, you prepare for learning by building on what you already know. Second, you adopt an active approach to learning instead of waiting for the key ideas to simply reveal themselves to you. Third, you pay attention to specific signals that indicate what material is significant. Fourth, you set about detecting organizational patterns that provide a broader view of the direction in which a reading assignment may be heading. And finally, once you've gone to the effort to extract the key ideas, you keep track of what you've been able to discern.

BUILDING ON WHAT YOU ALREADY KNOW

Learning doesn't happen in a vacuum, and it doesn't happen all at once. For any new learning to take hold in your mind, it has to be connected to prior learning, to the knowledge you've already made your own. The process of connecting new information to old and comprehending a whole body of new information happens one step at a time.

The first place to start is with the course syllabus. A typical syllabus provides an objective or a goal for the course and an overview of the course content. Use the syllabus to activate your mind about the subject of the course. At the beginning of the term, look over the syllabus for topics you already have some familiarity with, and spend a few minutes thinking about them. Notice, too, how and where they fit into the whole, how they relate to other topics you'll be studying in the course. Consult the syllabus throughout the term for specific reading assignments, and continue building your foundation by surveying your textbook and previewing specific assignments.

There's almost no limit to the amount of work you can put into studying your textbooks. It is hard work, but it can be pleausrably rewarding if it's done right. To do it right, you must mark up the pages of your textbooks

or take notes in a separate notebook. Taking notes on textbook material forces you to concentrate and makes reviewing not only easier but also much more profitable. In the absence of chapter notes, reviewing for an exam is like starting from scratch, from square one. The more careful your note-taking, the more knowledge you'll gain from reviewing. You have three systems to choose from:

- Standard System: underlining and jotting notes in the margins
- Questions-in-the-Margin System: writing questions in the margins and selectively underlining
- Separate Notes System: summarizing each textbook paragraph in a separate notebook

THE STANDARD SYSTEM

Here are some guidelines for using the Standard System to mark up your textbooks.

1. *Finish reading before marking.* Never mark until you have finished reading a full paragraph or a headed section and have paused to think about what you've just read. This no-marking procedure prevents you from grabbing at everything that looks important at first glance. During your initial reading, it may be difficult to tell whether the author is stating a new idea or using new words to restate an idea previously discussed. You need to understand the full context of a paragraph or section before you decide what to mark.

Read your textbook assignments a paragraph at a time. When you come to the end of a paragraph, look back at it and determine which sentence or sentences are most important. Then underline the key idea. In a different color, or with a different pen or pencil, mark any especially important secondary ideas you find. If you are marking your book with a highlighter pen, use another color or another writing instrument to mark the supporting ideas. You want to be able to pick out the key ideas easily without confusing them with ideas of lesser importance.

Remember that each paragraph generally has only one key idea, so be careful not to overmark your textbook or mark it hastily. A textbook assignment in which you have highlighted or underlined virtually every other sentence or where you have mistaken minor points for major ones will do you little good when you begin reviewing the assigned material in order to master it.

2. *Be extremely selective.* Mark so that when you review later, only meaningful words, phrases, and sentences stand out. You'll appreciate your good original judgments, decisions, and discipline.

3. *Use your own words.* Jottings in the margins should be in your own words. Because your own words represent your own thinking, they are powerful cues to the ideas on the page.

4. *Work swiftly.* Be efficient. Don't dawdle. Read, go back for a mini-overview, make your markings and jottings. Then move on.

5. *Work neatly.* Neatness is scholarly. Neatness at first takes conscious effort but not extra time. When you review, your neat jottings and markings will etch sharper, clearer, more incisive images in your mind.

6. *Use cross-referencing.* If you find an idea on page 64 that has a direct bearing on an idea on page 28, draw a little arrow pointing upward and write "28" by it in the margin. Then turn back to page 28 and alongside the idea there, draw an arrow pointing downward and write "64" by it. In this way you will be tying the two ideas together in your mind and in your reviewing.

7. *Be systematic.* Have you ever seen a scholar's well-worn copy of a favorite book? A cherished book usually bears the owner's mark—notes that have deep significance, underlinings, papers slipped between pages, cross-references, and an array of favorite symbols. A well-marked book becomes very much your own.

Figure 12.1 contains twelve suggestions for marking textbooks. Notice especially the use of single and double underlines; the use of asterisks, circling, and boxing for important items; and the use of the top and bottom margins for long notations or summaries. If some of these ideas appeal to you, work them into your marking system. Be sure to use them consistently so that you will remember instantly what they mean.

Textbook marking can be a useful aid to study and review, but marking must be done with thought and care. Otherwise it becomes busywork. Drawing lines and boxes and inserting symbols and question marks can give you a false sense of accomplishment if you are not thinking deeply about what you read. Besides, if you overmark your book, you will defeat your purpose: quick identification of important points. When you review, you will find yourself trying to decipher a code instead of reviewing ideas. Figure 12.2 shows a page with short, crisp questions in the margin, using the question mark (?) instead of the words *what* and *why* to save precious margin space.

Remember that the "you" who reviews the marked book will not be quite the same "you" who did the marking. As the term progresses, your knowledge will grow. By the end of the term, you will be accepting as commonplace many things that seemed so important to underscore, box, circle,

EXPLANATION AND DESCRIPTION	SYMBOLS, MARKINGS, AND NOTATIONS																
1. Use double lines under words or phrases to signify main ideas.	<u>Radiation can produce mutations. . .</u>																
2. Use single lines under words or phrases to signify supporting material.	<u>comes from cosmic rays. . .</u>																
3. Mark small circled numbers near the initial word of an underlined group of words to indicate a series of arguments, facts, ideas—either main or supporting.	Conditions change. . . ① <u>rocks rise. . .</u> ② <u>some sink. . .</u> ③ <u>the sea dashes. . .</u> ④ <u>strong winds. . .</u>																
4. Rather than underlining a group of three or more important lines, use a vertical bracket in the margin.	had known. . . who gave. . . the time. . . of time. . .																
5. Use one asterisk in the margin to indicate ideas of special importance, and two for ideas of unusual importance. Reserve three asterisks for principles and high-level generalizations.	* When a <u>nuclear blast</u> is. . . ** People <u>quite close</u> to the. . . *** The main <u>cause of mutations</u> . . .																
6. Circle keywords and key terms.	The <u>genes</u> are the. . .																
7. Box words of enumeration and transition.	<u>fourth</u> , the lack of supplies. . . <u>furthermore</u> , the shortage. . .																
8. Place a question mark in the margin, opposite lines you do not understand, as a reminder to ask the instructor for clarification.	The latest. . . cold period. . . about 1,000,000. . . Even today. . .																
9. If you disagree with a statement, indicate that in the margin.	Life became. . . on land only. . . 340 million years. . .																
10. Use the top and bottom margins of a page to record ideas of your own that are prompted by what you read.	Why not use carbon dating? Check on reference of fossils found in Tennessee stone quarry.																
11. On sheets of paper that are smaller than the pages of the book, write longer thoughts or summaries; then insert them between the pages.	<table border="1"> <thead> <tr> <th></th><th>Fossils</th></tr> </thead> <tbody> <tr> <td>Plants</td><td>= 500,000,000 years old</td></tr> <tr> <td>Insects</td><td>= 260,000,000 " "</td></tr> <tr> <td>Bees</td><td>= 100,000,000 " "</td></tr> <tr> <td>True Fish</td><td>= 330,000,000 " "</td></tr> <tr> <td>Amphibians</td><td>= 300,000,000 " "</td></tr> <tr> <td>Reptiles</td><td>= 300,000,000 " "</td></tr> <tr> <td>Birds</td><td>= 150,000,000 " "</td></tr> </tbody> </table>		Fossils	Plants	= 500,000,000 years old	Insects	= 260,000,000 " "	Bees	= 100,000,000 " "	True Fish	= 330,000,000 " "	Amphibians	= 300,000,000 " "	Reptiles	= 300,000,000 " "	Birds	= 150,000,000 " "
	Fossils																
Plants	= 500,000,000 years old																
Insects	= 260,000,000 " "																
Bees	= 100,000,000 " "																
True Fish	= 330,000,000 " "																
Amphibians	= 300,000,000 " "																
Reptiles	= 300,000,000 " "																
Birds	= 150,000,000 " "																
12. Even though you have underlined the important ideas and supporting materials, still jot brief cues in the side margins.	Adapt - _____ fossil - _____ layer - _____																

FIGURE 12.1 Using the Standard System to Mark Textbooks

FOOD AND MEDICAL PRACTICE

Why increase
in population?

The European population increased rapidly in the eighteenth century. Plague and starvation gradually disappeared, and Europeans lived longer lives.

Diets and Nutrition

Main food?

At the beginning of the eighteenth century, ordinary men and women depended on grain as fully as they had in the past. Bread was quite literally the staff of life. Peasants in the Beauvais region of France ate two pounds of bread a day, washing it down with water, green wine, beer, or a little skimmed milk. Their dark bread was made from a mixture of roughly ground wheat and rye—the standard flour of the common people. The poor also ate grains in soup and gruel. In rocky northern Scotland, for example, people depended on oatmeal, which they often ate half-cooked so that it would swell in their stomachs and make them feel full.

Ingredients
of bread?

Scotland –
main grain?
Half-cooked –
why?

“Just price”?

Not surprisingly, an adequate supply of grain and an affordable price for bread loomed in the popular imagination. Peasants, landless laborers, and urban workers all believed in the old medieval idea of the “just price”—that is, a price that was “fair” to both consumers and producers. But in the later eighteenth century, this traditional, moral view of prices and the economy clashed repeatedly with the emerging “free-market” philosophy of unregulated supply and demand, which government officials, large landowners, and early economists increasingly favored. In years of poor harvests and soaring prices, this clash often resulted in food riots and popular disturbances. Peasants and workers would try to stop wagons loaded with grain from leaving their region, or they would seize grain held by speculators and big merchants accused of hoarding and rigging the market. (Usually the tumultuous crowd paid what it considered to be a fair price for what it took.) Governments were keenly aware of the problem of adequate grain supplies, and they would sometimes try to control prices to prevent unrest in crisis years.

Free market –
explain?
Favored whom?
Poor harvests –
reaction?

Food riots?

Government
action?

FIGURE 12.2 Simple Marking of a Textbook Page.

No need to use what & why. Use question marks. Source: John P. McKay, Bennett D. Hill, and John Buckler, *A History of World Societies*. Copyright © 2000 by Houghton Mifflin Company, Boston. Reprinted with permission.

star, question, comment on, or disagree with at the beginning of the term. Your early marks may hamper your review. So use the help that marking can give you, but don't go overboard.

On the following pages are examples of appropriately marked textbook pages. Figure 12.3 shows how to organize a page using enumeration; that is, encircling words such as *first* and *second*. Write in numbers to identify salient points. The underlinings should be sparse and form the answers to the questions in the margins. This type of organization not only helps you to comprehend and remember the main points of the page, but also helps immensely when you're studying for an examination and time is short.

Figure 12.4 shows how only a *few* brief questions in the margin can set up the cues for the entire page. A margin too crowded with cue-questions can confuse rather than clarify sequential concepts.

Figure 12.5 shows that where numerous questions in the margin are necessary, briefness keeps the margin from appearing overloaded. The judicious underlinings of the answers in the text establish an easy-to-spot relationship between question and answer.

THE QUESTIONS-IN-THE-MARGIN SYSTEM

The guidelines for using the Questions-in-the-Margin System to mark up your textbook are surprisingly few.

1. *Survey* an entire chapter.
2. *Return* to the first paragraph and read it thoroughly to answer this question: "What's important here?"
3. *Write* a brief, telegraphic question in the margin of your textbook that requires for an answer the important point or points that you perceive in the paragraph.
4. *Underline* only the keywords, key phrases, and key sentences that make up the answer to the question you wrote in the margin.

These four steps provide you with the essential questions and the appropriate answers. With this strong, uncomplicated system, you need nothing else (see Chapter 11 for a detailed discussion of this system).

Figure 12.6 is an example of how to formulate margin questions. Your questions may be specific or general—whichever best helps you master the facts and ideas in your textbook. To add interest and variety, make up some true-false questions as well as some fill-ins. The closer your questions are to actual test questions, the better will be your memory of the facts and ideas in the textbook.

MARITIME EXPANSION

Ming period
Naval expeditions
When? Who?

Naval history

Relative power?

Portugal power
when?

Purpose of
expeditions?

Tribute system??

2 motives?

Contender –
who?

Admiral?
1st expedition

Ship's size?

Sea route?

3 consequences?

Another dramatic development of the Ming period was the series of naval expeditions sent out between 1405 and 1433 under Hong Wu's son Yong Lu and Yong Lu's successor. China had a strong maritime history stretching back to the eleventh century, and these early fifteenth-century voyages were a continuation of that tradition. The Ming expeditions established China as the greatest maritime power in the world—considerably ahead of Portugal, whose major seafaring reconnaissances began a half-century later.

In contrast to Hong Wu, Yong Lu broadened ^①diplomatic and ^②commercial contacts within the tribute system. Yong Lu had two basic motives for launching overseas voyages. First, he sent them in search of Jian Wen, a serious contender for the throne whom he had defeated but who, rumor claimed, had escaped to Southeast Asia. Second, he launched the expeditions to explore, to expand trade, and to provide the imperial court with luxury objects. Led by the Muslim eunuch admiral Zheng He and navigating by compass, seven fleets sailed to East and South Asia. The first expedition (which carried 27,800 men) involved 62 major ships, the largest of which was 440 feet in length and 180 feet in the beam and had 9 masts. The expeditions crossed the Indian Ocean to Ceylon, the Persian Gulf, and the east coast of Africa.

These voyages had important consequences. They extended the prestige of the Ming Dynasty throughout Asia. ^①Trade, in the form of tribute from as far as the west coast of southern India, greatly increased. ^②Diplomatic contacts with the distant Middle East led to the arrival in Nanjing of embassies from Egypt. ^③The maritime expeditions also led to the publication of geographical works.

FIGURE 12.3 Use of Enumeration in Textbooks

Use of enumerations by number and encirclements. Source: John P. McKay, Bennett D. Hill, and John Buckler, *A History of World Societies*. Copyright © 2000 by Houghton Mifflin Company, Boston. Reprinted with permission.

5	7	3																	
9	0	7	6																
8	5	4	0	2															
0	9	1	3	5	6														
8	6	0	4	8	7	2													
1	7	5	4	2	4	1	9												
9	6	5	8	3	0	8	0	1											
5	7	3	5	1	2	0	2	8	5										
3	1	7	9	2	1	5	0	6	4	2									
2	1	0	1	6	7	4	1	9	8	3	5								

Try this memory-span task. Read the top row of digits, one per second, then look away and repeat them back in order. Next, try the second row, and so on, until you make a mistake. The average person's memory span can hold seven items of information.

FIGURE 6.4 Memory-Span Test

Capacity
of STM?

Miller's
article?

8th or
9th item?

To store
7 plus—
how?

Meaning—
repackag-
ing?

Limited by attentional resources, short-term memory can hold only a small number of items. How small a number? To appreciate the limited capacity of STM, try the *memory-span* task presented in Figure 6.4, or test a friend. By presenting increasingly long lists of items, researchers seek to identify the point at which subjects can no longer recall without error. In tasks like this one, the average person can store seven or so list items (usually between five and nine)—regardless of whether it consists of numbers, letters, words, or names. This limit is so consistent that George Miller (1956) described the capacity of STM by the phrase, "the magical number seven, plus or minus two."

Once short-term memory is filled to capacity, the storage of new information requires that existing contents be discarded or "displaced." Thus, if you're trying to memorize historical dates, chemical elements, or a list of vocabulary words, you may find that the eighth or ninth item pushes out those earlier on the list. It's like a computer screen. As you fill the screen with new information, old material scrolls out of view. This limited capacity seems awfully disabling. But is it absolutely fixed, or can we overcome the magical number seven?

According to Miller, STM can accommodate only seven items, but there's a hitch; although an item may consist of one letter or digit, these can be grouped into chunks of words, sentences, and large numbers—thus enabling us to use our storage capacity more efficiently. To see the effects of chunking on short-term memory, read the following letters, pausing at each space; then look up and name as many of the letters as you can in correct order: CN NIB MMT VU SA. Since this list contains twelve discrete letters, you probably found the task quite frustrating. Now try this next list, again pausing between spaces: CNN IBM MTV USA. Better, right? This list contains the same twelve letters. But because these letters are "repackaged" in familiar groups, you had to store only four chunks, not twelve—well within the "magical" capacity (Bower, 1970).

FIGURE 12.4 Few Notations for Descriptive Prose

Source: Saul Kassin, *Psychology*. Copyright © 1995 by Houghton Mifflin Company, Boston. Reprinted with permission.

FROM COLONY TO NATION

When?

Who?

What?

Where?

2nd find where?

3rd find where?

Prospectors from?

One result?

Improvement
in what?

Former mode?

Americans
introduced?

Extent of coaches?
R.R. began
coverage?

On February 12, 1851, Edward Hargraves, an Australian-born prospector who had returned to Australia after unsuccessful digging in the California gold rush of 1849, discovered gold in a creek on the western slopes of the Blue Mountains. Hargraves gave the district the biblical name Ophir (Job 22:24), and the newspapers said the region was "one vast gold field." In July a miner found gold at Clunes, 100 miles west of Melbourne, and in September gold was found in what proved to be the richest field of all, Ballarat, just 75 miles west of Melbourne. Gold fever convulsed Australia. Although the government charged prospectors a very high license fee, men and women from all parts of the globe flocked to Australia to share in the fabulous wealth.

Contemporaries agreed with explorer and politician W. C. Wentworth, who said that the gold rush opened in Australia a new era "which must in a very few years precipitate us from a colony to a nation." Although recent scholars have disputed Wentworth, there is much truth to his viewpoint. The gold rush led to an enormous improvement in transportation within Australia. People customarily traveled by horseback or on foot and used two-wheel ox-drawn carts to bring wool from inland ranches to coastal cities. Then two newly arrived Americans, Freeman Cobb and James Rutherford, built sturdy four-wheel coaches capable of carrying heavy cargo and of negotiating the bush tracks. Carrying passengers and mail up to 80 miles a day, a week's work for ox-drawn vehicles, by 1870 Cobb and Co. coaches covered 28,000 miles per week. Railroad construction began in the 1870's, and by 1890 9,000 miles of track were laid.

FIGURE 12.5 Brief Markings in the Margins

Use of when, who, what, and where without additional words. Bare underlines direct eyes to facts and details. Source: John P. McKay, Bennett D. Hill, and John Buckler, *A History of World Societies*. Copyright © 2000 by Houghton Mifflin Company, Boston. Reprinted with permission.

WATCH OUT FOR QUICKSAND!

What happened
to Jack Pickett?

How long did it take?

Is quicksand real?

What did a geologist
say about Q.S.?

Where is Q.S. found?

If Q.S. is firm, what to do?

If Q.S. is soft, what to do?

Why not raise your arms?

What kind of movements
to make?

What kind, not to make?

Two ways to get out of Q.S.?

Final advice?

While hiking in the swamplands of Florida, Fred Stahl watched Jack Pickett disappear before his eyes. Pickett had stepped onto what looked like an innocent patch of dry sand and then started to sink. Within fifteen minutes, Pickett had disappeared completely beneath the surface.

Pickett was a victim of quicksand. If you think quicksand is something found only in adventure novels or films, you're making a big mistake. And that mistake could cost you your life.

Geologist Gerald H. Matthes, who once escaped from quicksand himself, always gave this message to hikers: "Anyone who ever walks off the pavement should learn about quicksand." It can be found almost anywhere.

Here are some of Matthes' tips on how to prevent being helplessly sucked under by quicksand. First of all, if you step into quicksand that is firm enough, you may be able to run out. But you have to move fast. If, however, the sand pulls your legs in too quickly for you to escape this way, throw yourself flat on your back. That's right — you can actually float in quicksand. Don't make the common mistake of raising your arms. Resting on the surface, your arms can help you to float. Any movements you make should be slow and deliberate. Quick, jerky movements can cause you to be completely sucked in, just as Jack Pickett was. Try doing a slow breaststroke or slowly rolling yourself to firm ground. Above all, don't panic.

FIGURE 12.6 Questions-in-the-Margin System

The best way, perhaps the only sure way, for you to come to grips with comprehending a paragraph is using the Questions-in-the-Margin System. Upon finishing a paragraph, you must ask yourself aloud, "What question was answered?" Then jot this question briefly in the margin.

If you can't formulate a question, go back and reread the paragraph until you understand it. This rereading forces you to do it by yourself, for yourself. This is the only way to become an *independent sovereign learner*. Formulating your own question is a personal victory.

The following episode's sole purpose is to illustrate the system's power. My hope is that this student's enthusiasm will rub off and stick to you.

Scott Solomon, a medical student studying to become a neurosurgeon, said that he had always wanted to read Immanuel Kant's *Critique of Pure Reason* but was afraid that it was beyond his background and capabilities. Then he ran across the Questions-in-the-Margin System. He tried it—and was highly successful. He was able to explain Kant's work to others.

Here's what he says: "It's been a sheer joy. There is nothing in the world I love more than going back and reviewing using the questions in the margins. I simply cannot express my gratitude to you for that technique."

Finally, two more sentences from Scott: "Reading your article again on the Questions-in-the-Margin technique got me really excited. To me, it's just amazing that since the time of Homer until now, no one ever came up with this omnipotent technique. Are you sure you didn't pirate the method from some 13th century Cathari tract?"¹

In using the Questions-in-the-Margin System, Scott added these practical refinements: First, to make such dense writing both legible and small enough to fit the limited space in the margins, he used a mechanical pencil with 0.3-mm lead, rather than the thicker 0.5-mm lead. Second, he numbered each question and the portion of the text to which the question pertained. In this way, the question and the text portion could be matched quickly and accurately. Third, to identify the portion of the text, he used a thick slanted line. Fourth, he underlined the pertinent portion of the text. (See Figure 12.7).

Interestingly, Figure 12.7 is a portion of a 225-page book. A total of 1,669 questions were formulated.

THE SEPARATE NOTES SYSTEM

Here are some guidelines for making separate notes on the material in your textbooks.

1. Use the Cornell note-taking system format. Mark a two-and-one-half-inch margin on the left of your paper, leaving a six-inch-wide area on the right in which to make notes (see Figure 10.1, page 237). Use the narrow margin for keywords. This is the ideal format for recording, reciting, and reviewing. Figures 12.8 and 12.9 illustrate this format.

2. Finish reading before you take notes. Never write a note until you have finished reading a full paragraph or a headed section. This prohibition will keep you from summarizing everything that may look important to you at first glance.

3. Be extremely selective. Pick out the essentials and write them concisely. This rule is probably the most difficult of all to follow, because to be

¹Scott Solomon, Department of Neurology, College of Physicians & Surgeons of Columbia University, New York, New York.

FROM SCHOPENHAUER TO SOREL

For The Enlightenment, as we saw earlier, the enemy of ideology was paradoxically, ideology. Ideology in the sense of a science of ideas would combat ideology in the sense of dogma, prejudice and mindless traditionalism. Behind this belief lay a supreme confidence in reason typical of the middle class in its 'progressive' phase: nature, society and even the human mind itself were now raw materials in its hands, to be analyzed, mastered and reconstructed.

As this confidence gradually wanes throughout the nineteenth century, with the emergence of a fully fledged industrial capitalist order about which there seemed little rational, a new current of thought comes to the fore. In a society where reason has more to do with the calculation of self-interest than with some noble dream of emancipation, a scepticism about its lofty powers steadily gathers force. The harsh reality of this new social order would seem not reason, but appetite and interest; if reason has a role at all, it is the purely secondary one of estimating how the appetites can be most effectively gratified. Reason can help to promote our interests, but it is powerless to pass critical judgement on them. If it can 'ventriloquize' the passions, it remains itself entirely mute.

Such a standpoint had already been part of the familiar stock-in-trade of English empiricist philosophy, from Thomas Hobbes to David Hume. For Hume, reason can only ever be the slave of passion; and for this trend of

100-2

What was the enemy of ideology for the Enlightenment?

100-4

What was behind the belief that science of ideas could combat dogma & prejudice?

100-5

When did this confidence wane?

[1-2]

100-6

What was the harsh reality of the new social order?

100-7

What is the new role for reason?

100-8

Where was this 19th century development foreshadowed?

100-9

What was David Hume's view of reason?

Figure 12.7 Textbook Page with Questions in the Margin

Source: Thomas Eagleton, *Ideology: An Introduction* (London: Verso Press, 1991) p. 159.

Keywords

Notes on the Chapter

<p>Contour lines</p> <ol style="list-style-type: none"> 1. steep slope 2. gentle slope 3. cross 4. streams 	<p>General rules for contour lines</p> <ol style="list-style-type: none"> 1. Steep slope – lines close together 2. Gentle slope – lines are spread 3. Lines <u>never</u> cross 4. Lines crossing streams – bend upstream
--	--

FIGURE 12.8 The Cornell Format Used for Material Emphasizing Facts

Keywords

Notes on the Chapter

<p>Song of Roland</p> <p>defeat</p> <p>french valor</p> <p>magic horn</p> <p>no love story</p> <p>knighthood</p>	<p>Song of Roland (medieval epic)</p> <p>One of the noblest poems in Europe. Celebrating a <u>defeat</u>, the French fought with such supreme <u>valor</u> that the defeat was vindicated. Roland had a magic horn which Charlemagne could hear. Poem is wonderfully concentrated on a single incident. Virtually no love story. A rugged, primitive poem. The finest ideals of knighthood have been crystalized in it.</p>
--	---

FIGURE 12.9 Notes on Material Emphasizing Ideas and Relationships

selective you must read critically and think about what you have read. Then you'll be able to summarize each paragraph in *one sentence*. Don't try to master every idea, fact, and detail in the book; get the important ideas and the basic principles. Don't try to rewrite the textbook in longhand, for you won't be accomplishing a thing. Simply read the paragraph and re-read it if necessary, decide *at that time* what is important, and write your one-sentence summary.

4. Use your own words. After finishing the paragraph or section, ask "What is the author's main point?" Recite it, and then quickly write it in the

words you just spoke. Do not mechanically transfer words from the textbook to your notebook. You will be bypassing your mind and wasting time and energy.

5. *Write full sentences.* Do not make notes in outline form. Rather, write full sentences expressing full thoughts—as you will have to do during an exam. Also, when you review and restudy, you will be able to perceive each idea instantly. Neat writing will also be of help when you review.

6. *Be swift.* You don't have all day and night for note taking. Keep alert and press for efficiency. Read, go back for a mini-overview, recite the author's idea, and write it. Then attack the next portion of the chapter.

7. *Don't forget visual materials.* Important diagrams, like important facts and ideas, should be transferred to your notebook, recited, and reviewed. In biology, for example, a sure way of memorizing the structure of the amoeba is to sketch it, labeling all parts. Take notes on the important aspects of maps, charts, and tables as well; they are vital parts of your text.

Figure 12.8 shows the kind of notes you might use for material that requires an orderly listing of facts, principles, or rules. Though at first glance the notes in this example may appear to be a formal outline, they are not. The facts in the wide column under "General rules for contour lines" form a simple list, and the sentences are almost complete.

Figure 12.9 shows notes on material that deals more with ideas and their relationships than with facts. Here you would be reading for concepts and theories that are likely to span many paragraphs. You would skim in your overview to get an idea of what the main concepts are and how extensively they are treated. Your task then would be to summarize and condense many paragraphs into one or two.

Slow readers often find that note taking forces them to concentrate better, and they go through each chapter faster than before. Rapid readers slow down a bit, but they learn to read with a new thoroughness.

Edward W. Fox, Cornell University's great teacher, lecturer, and historian, had this to say about note taking:

Notes are a means to an end and not the end in themselves. Some system is desirable, but a very common failing among beginning students is to develop a method so complicated and formal that it wholly defeats its purpose.

Notes taken in paragraph form on a page with a . . . left-hand margin are the most generally useful. Elaborate arrangements tend to confuse, and the traditional topical form, the use of Roman numerals, capital letters, Arabic numerals, and small letters, etc., with much indentation, has a fatal tendency to imply a logical analysis rather than elicit one.²

²Edward W. Fox, *Syllabus for History* (Ithaca, NY: Cornell University Press, 1959). Reprinted by permission of the author.

	<p>Chester G. Starr, Jr., <u>The Emergence of Rome</u>, Ch. I: "Geography and People of Ancient Italy"</p> <p>Geography is very influential factor. Italy, long-narrow peninsula in center of Med. Sea.</p> <p><u>Physical Aspect</u> :</p> <p>Italy divided into 2 sections — peninsula — Med. land imp. in ancient times, other — north of Po R. imp. medieval and modern times. Plains in Italy very hilly — stone villages on hillsides so more room for farming.</p> <p><u>Climate</u> : Winter — westerly winds with rainstorms. Spring — Sahara blast — drought in summer. Rome: two months without rain. Po Valley — water from Alps.</p>
--	--

FIGURE 12.10 Telegraphic, Categorized Notes

The student will jot key words in the left margin during review. Source: Adapted from Edward W. Fox, *Syllabus for History* (Ithaca, NY: Cornell University Press, 1959). Reprinted by permission of the author.

Remember, Professor Fox is talking about notes taken from books by a student who is either in his or her room or in the library. Under such unhurried conditions, he advocates making notes in *paragraph* form, thus helping the student to express knowledge fully, in the same way you would if you were writing a short essay in an exam. This is not note writing in a lecture room, where a student has to write fast and in telegraphic style. Professor Fox is also against making notes in the framework of a *formal outline* (see Figure 12.10).

Drawing Diagrams in Your Notebook

A word about taking notes on maps, charts, diagrams, and tables is in order. Such materials are not window-dressing; they are an important part of the text and convey information that either supplements or explains it. A map of a military campaign, a chart showing how the average dollar is spent, a diagram illustrating how distances are measured by triangulation, a table giving figures on increase in population—all these should be studied and, if important enough, sketched in your notebook. These nonverbal notes, just

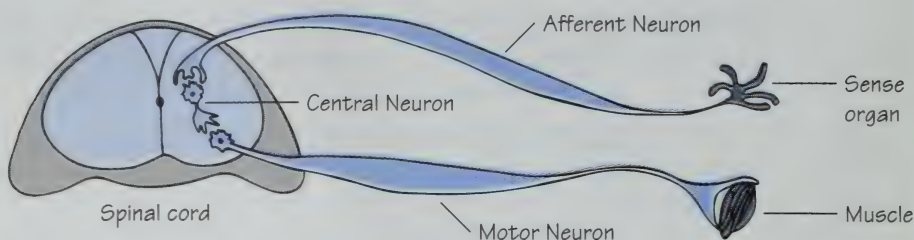


FIGURE 12.11 Diagramming as a Study Aid

This sketch shows the short reflex arc from a sense organ to a reacting organ.

like your verbal notes, should be studied by the process of recall. In biology, for example, one sure way of memorizing the structure of a neuron connection is to sketch it, labeling its parts and properties, until you can easily reproduce it so that it looks something like Figure 12.11. After sketching and seeing the diagram repeatedly, you will be able to visualize it whenever you wish.

TAKING NOTES ON SUPPLEMENTAL READING

In many undergraduate courses, assignments and lectures focus on a single textbook, but instructors often assign outside reading in other publications. Reasons for assigning the extra work include the following:

1. To amplify topics treated in the textbook or mentioned in class lectures
2. To go into greater detail—for example, by assigning original documents or primary sources
3. To expose students to another point of view or a different philosophy
4. To bring background material into discussions

Instructors generally do not expect you to master such supplementary material as thoroughly as you master your textbook. Nevertheless, once the assignment has been made, you must cope with it, in addition to the regular assignments. Clearly, you cannot spend an inordinate amount of time, but you must learn something from your supplemental reading. Here are some suggestions for doing so.

1. Try to figure out why the book was assigned. You might ask the instructor. If you find out, then you can skim the book looking for pertinent material, disregarding all the rest.
2. Read the preface. As you already know from Chapter 11, the preface provides inside information. It may tell you how this book is different from your textbook.
3. Study the table of contents. Notice especially the chapter titles to see whether they are like those in your textbook or different. If the chapters with similar titles contain the same information as the chapters in your textbook, then read the chapters that do not duplicate your textbook's coverage. (Do this with topics covered in your classroom lectures, too.)
4. If you have not yet found an "angle," read the summarizing paragraph at the end of each chapter. Make brief notes on each chapter from the information thus gained. With these notes spread out before you, try to see the overall pattern. From the overall pattern, come up with the author's central thesis, principle, problem, or solution.
5. Don't leave the book with only a vague notion of what it is about. You must come up with something so definite that you can talk about it the next day or write about it two weeks later. Do not waste time on details, but be ready to answer general questions: What was the author's central approach? How was it different from that of your textbook? How was it the same? Look for the central issues around which everything else is organized.
6. Have the courage to think big. If you lack courage, you'll waste time on minor details that you won't remember. Select the big issues and concentrate on them.

When a highly condensed summary of a book or of a long selection is required, you need a special approach. The introduction-thesis-body-conclusion sequence is useful in forcing you to understand the material and the way the author develops and supports it. Furthermore, a summary that follows this sequence can be highly condensed; you may be able to capture the main ideas of a collateral book in only a page or two of notes. Figure 12.12 is an example.

USING YOUR NOTES

When you have read and comprehended an assignment and have made notes on the central points, you are ready to practice the active recall

Experiment in living close to nature.

I. Introduction

Thoreau voluntarily withdrew from civilization which he felt was getting too complicated. He spent 2 yrs., 2 mos., and 2 days living at Walden Pond to regain the simplicity of life that comes when one lives close to the soil.

Each man and woman should pause to decide just how they should spend their lives. Are they paying too dearly for unessentials?

II. Thesis

In a complex civilization, the fast flowing current of unessentials stemming from custom, tradition, advertising, etc., somehow sweeps a person away from the genuine goals in life.

Only by temporarily cutting oneself off from civilization, could people realize that their lives need not be so complex. By getting back to nature to rethink the basic issues of life people can chart their course, and attempt to steer their lives in accordance with these standards (not expediences set up by the pressures of complex civilization).

People should awaken and become aware of real life.

III. Body

Thoreau did not wish to hold up progress or civilization; rather, he wished that people would be more contemplative and selective in their actions.

Thoreau chronicled his experiences at Walden Pond. He wanted to become familiar with nature.

- a. He built his own hut.
- b. Average cost of living a week was 27 cents.
- c. He observed nature: trees, birds, animals, etc.

Live simply & you will live more fully.

He believed that every person ought to measure up to the best they could do. What the best is, depends upon the individual. To have a standard to measure up does not mean that all must have the same, but every one should measure up to a standard in the best way she or he is able to.

Urged people to reject unessentials, and get back to fundamentals.

IV. Summary

Thoreau wanted to demonstrate that many so-called necessities were not necessary at all. He wanted people to observe, appreciate, and evaluate what was important in life. Once people set their sights upon the good life, they should follow their sights without compromising.

FIGURE 12.12 Notes in the Form of a Highly Condensed Summary

that will convert facts and concepts into knowledge you can retain and use. Read over your notes to be sure that they say what you mean and are clear enough to mean the same thing weeks and even months later.

If you have not already done so, take the final step and summarize the notes you have made. If you have used the Cornell System for taking separate notes, study the left-hand column keywords and the right-hand notes to which they pertain. Write a brief, informative summary at the bottom of the page. If you have used either the Standard System or the Questions-in-the-Margin System, you can summarize your left-hand column notes at the end of the chapter or on a separate piece of paper.

Then study one section of your notes at a time. Cover a portion of the right-hand section with a piece of paper and, from the cues, try to recall the section, reciting aloud or even writing it out. Look again at your notes to see what errors you made or what you forgot. Repeat the process until you can accurately repeat the material in your own words. (This is the same procedure recommended for effective study of lecture notes in Chapter 10.)

There is no better way to prepare for an examination than training yourself to reproduce your notes without looking at them.

COMBINING TEXTBOOK AND LECTURE NOTES

The format shown in Figure 12.13 is ideal for lectures that mainly explain and amplify the textbook. First, in the middle column, record your notes on a previously assigned textbook chapter. Then, when you take lecture notes in the right-hand column, you can avoid repeating material you already have, while you add the lecturer's explanations, examples, and supplementary comments. When you become accustomed to the lecturer's ways, you will be able to judge how much space to leave between items in the middle column in order to keep lecture notes and textbook notes directly opposite each other. The cue words or questions that you write in the left column should pull the two sets of notes together.

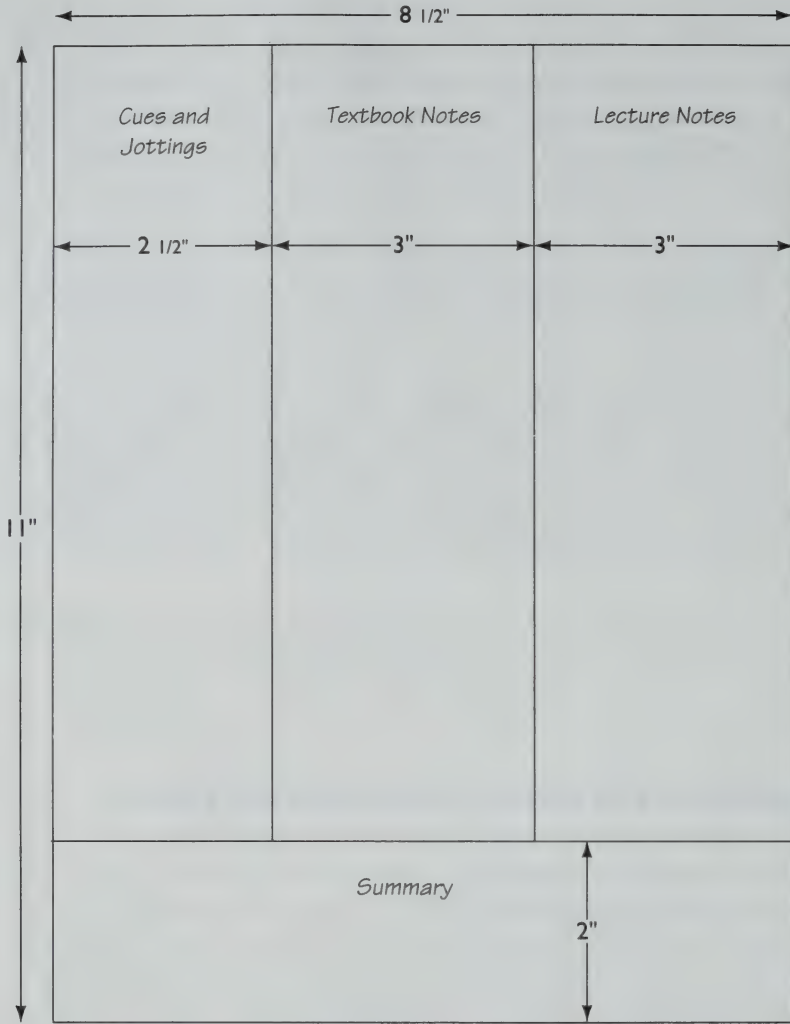


FIGURE 12.13 Cornell System Format for Combining Textbook and Lecture Notes

SUMMARY

What's the purpose of marking my textbook?

*Promotes concentration
increases understanding
simplify reviewing*

Marking your textbook promotes concentration and thereby increases understanding. Marks both in the margin and in the text itself simplify reviewing.

Standard System
Questions-in-the-Margin
Separate Notes System

What are my options for taking notes?

What steps are involved in the Standard System?

Are there pitfalls to textbook marking?

overmarking

What are the guidelines for the Questions-in-the-Margin System?

Survey - to get feel
1 paragraph at time
what important
form quest? ^{main} points
Underline

What are the guidelines for taking separate notes?

Note Paper
Read ~~up~~ before taking notes
write down only essential
express in own words
Treat diagram important
(PUT IN NOTES)

What are supplemental readings?

Book & Articles
that your instructor assigns

You have a choice of three systems: (1) the Standard System, (2) the Questions-in-the-Margin System, (3) the Separate Notes System.

There are seven steps: (1) Finish reading before marking. (2) Be extremely selective. (3) Use your own words. (4) Work swiftly. (5) Work neatly. (6) Use cross-referencing. (7) Be systematic.

The major pitfall is overmarking. Your purpose is to aid concentration and review, not to decorate your textbook with circles, underlines, and squiggles. Keep in mind that your learning increases as the semester goes on, so try not to mark too many things that will seem obvious to you in a few weeks.

Survey the entire chapter to get a feel for it. Then read one paragraph at a time. At the end of each paragraph, take a moment to decide what's important. Once you've done this, try to formulate a question that will draw out the paragraph's main point or points. Then underline the words, terms, or phrases that make up the answer to your question.

Use note paper that has been ruled for the Cornell System format. Read a full paragraph before you begin taking notes. Write down only the essentials and, to ensure understanding, express them in your own words. Write complete sentences, swiftly and neatly. Don't ignore the visuals: Treat an important diagram like an important idea. Neither should be left out of your notes.

Supplemental readings, also known as outside readings, are books and articles that your instructor assigns to supplement your regular textbook in some way.

Should I approach these readings as I do assignments in my textbook?

Concentrate on the BIG issues
 No. Grab author's main thesis, principles, methodology, problems, solutions

Should I stop once I've taken notes?

NO.
 Capitalize by summarizing your notes
 Recite for other 2.

No. Instructors generally want you to take a broad view of supplemental readings. Your goal is to grasp the author's main thesis as well as the principles that are applied, the methodology that is used, and the problems and solutions that are mentioned. In short, concentrate on big issues rather than on details.

No. Capitalize on what you've learned in the note-taking process by summarizing your notes. If you've used the Cornell System, summarize in the two-inch section at the bottom of the page. If you've used the Standard System or the Questions-in-the-Margin System, summarize either at the end of the textbook chapter or on a separate sheet of paper. Then cover the right-hand material and use the key words in the left-hand column to recite your notes.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Try to summarize a textbook paragraph in a single _____.
word phrase sentence
2. Your questions in the margin should always be _____.
specific general telegraphic
3. Too much information in the margin will tend to make reciting too _____.
easy long-winded difficult

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|----------------------|---|
| _____ 1. Summarizing | a. Needed before you can mark efficiently |
|----------------------|---|

- | | |
|------------------------|---|
| _____ 2. Reviewing | b. Can create a false sense of accomplishment |
| _____ 3. Overmarking | c. Can be used in understanding supplemental materials |
| _____ 4. Outlines | d. Lets only meaningful words, phrases, and sentences stand out |
| _____ 5. Amplification | e. Primary activity in the Separate Notes System |
| _____ 6. Preface | f. Should not be used for separate note taking |
| _____ 7. Context | g. One of the purposes of supplemental readings |
| _____ 8. Selectivity | h. Becomes easier when textbooks are marked |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. The Questions-in-the-Margin System works best when used in conjunction with other note-taking methods.
- _____ 2. Marking your textbook forces you to concentrate.
- _____ 3. Marginal jottings should be expressed in your own words.
- _____ 4. True-false questions can be used along with the Questions-in-the-Margin System.
- _____ 5. You can never really overmark your textbook.
- _____ 6. The "you" who marks your textbook is not the same as the "you" who reviews it.

Multiple choice. Choose the phrase that completes each following sentence most accurately, and circle the letter that precedes it.

- 1. Rapid readers who take notes
 - a. read even more quickly.
 - b. read with a new thoroughness.
 - c. no longer need to concentrate.
 - d. do all the above.

2. In both marking a textbook and taking textbook notes, you should
 - a. be accurate, rather than neat.
 - b. write or mark quickly to save time.
 - c. use the author's words whenever possible.
 - d. mark or note everything that looks important.
3. Underlining your textbook helps you to
 - a. know that you have already studied that particular section.
 - b. concentrate and understand main points.
 - c. keep alert and awake.
 - d. quickly identify the important points when reviewing.

Short answer. Supply a brief answer for each of the following items.

1. How do you combine the techniques used in the Standard System with those of the Questions-in-the-Margin System?
2. When you are taking separate notes on your textbook, why does Professor Fox advocate writing the ideas and facts in full-paragraph form?
3. Why combine, on one note sheet, the notes from the textbook and the notes from lectures?

THE WORD HISTORY SYSTEM

chapel chap'-el *n.* A place of worship that is smaller than and subordinate to a church.

Chapel: *from the sacred cloak of St. Martin*



Late Latin *cappa* meant “cloak,” and a diminutive form, *cappella*, spelled also *capella*, meant “a little cloak,” “a hood,” “a cowl.” The cloak worn by St. Martin of Tours, who died in the fourth century, was preserved as a holy relic, and the word *capella* was used to refer to the shrine in which St. Martin’s cloak was kept. So *capella* came to mean a place for keeping sacred things, and finally any holy place, or place of worship, the meaning of the Old French form *chapele*, taken into English as *chapel*. The guardian of the shrine where St. Martin’s cloak was kept was called in Latin *capellanus*, which gave French *chapelain*, English *chaplain*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

It is a *capital* mistake to theorize before one has data.

—Sir Arthur Conan Doyle (1859–1930), British physician and novelist, author of Sherlock Holmes series

1. *capital* mistake federal criminal major

A theory has only the alternative of being right or wrong. A model has a third possibility—it may be right but *irrelevant*.

—Manfred Eigen (1927–), German chemist

2. but *irrelevant* unreliable unrelated dangerous

Economics is a subject *profoundly conducive* to *cliché*, *resonant* with boredom. On few topics is an American audience so practiced in turning off its ears and minds. And none can say that the response is ill advised.

—John Kenneth Galbraith (1908–), American economist

- | | | | |
|----------------------|------------|--------------|--------------|
| 3. <i>profoundly</i> | completely | academically | abundantly |
| 4. <i>conducive</i> | impartial | favorable | difficult |
| 5. <i>cliché</i> | grasp | ridicule | trite phrase |
| 6. <i>resonant</i> | complete | filled | echoing |

THINKING VISUALLY

Man's body is faulty, his mind untrustworthy, but his imagination has made him remarkable.

—JOHN MASEFIELD (1878–1967), ENGLISH AUTHOR AND POET LAUREATE

Most of us are comfortable with reading and writing in words. But the same doesn't usually hold true for pictures. This means that the entire right half of our brains, the half that processes pictures, is largely ignored or underused during a typical school day. If you can learn to read and write in pictures as comfortably as you do in words, then you will be adding a visual dimension to your studying that could dramatically affect your learning and remembering. To aid you in thinking visually, this chapter deals with:

- Using your whole brain
- Making your memory stronger
- Extracting meaning from pictures
- Using the OPTIC system
- Expanding understanding with graphics
- Turning abstract ideas into maps

THINKING VISUALLY

Using Your
Whole
Brain

Improve Your
Understanding

Make Your
Memory
Stronger

Extracting
Meaning
from Pictures

Use the
OPTIC
System

Learn the
Language of
Graphs

Expanding
Understanding
with Graphs

Add Illustrations
to Your
Notes

Turn Abstract
Ideas into
Maps

We live in a world of words, where reading and writing are crucial not only to our success but also to our survival. But words are not our only form of communication (see Figure 13.1). Think of the millions of pictures that flash on your TV screen, or consider the signs that use only pictures and shapes to convey their meanings. Although there's little danger that words will become extinct, the role of visual images appears to be increasing. Learning to think visually will broaden your mind. With your whole brain engaged, you'll be able to extract messages from pictures and use visuals to expand your understanding.

USING YOUR WHOLE BRAIN

Although each of us has only one brain, that brain is divided into two distinct sides, or hemispheres, each with a separate set of functions. The chief function of the left side of the brain is to process written and spoken information. As you might expect, that side of the brain gets quite a workout. Although the right side does not get nearly as much use, its job is nevertheless important. One of the main functions of the brain's right side is to



FIGURE 13.1 Words Are Not Our Only Form of Communication

analyze and interpret visual information. Thinking in pictures puts the right side to work. Suddenly, instead of relying primarily on the left side of the brain, you're using both hemispheres. Your analysis of information is more balanced. This is why thinking in pictures can be said to broaden your mind. And with this broader mind, you are able to understand and remember information more easily than you could when you did the bulk of your thinking with only the left half of your brain.

Improve Your Understanding

There is some information that the left side of the brain may be unable to understand without help. Take, for example, an elaborate set of street directions. Written out, they become the responsibility of the left side of the brain. And yet, you can read and reread all the directions and still wind up scratching your head and getting lost. But if you put this same information into visual form—in this case, a map—you give your right brain a chance to interpret the data. With the two sides of the brain working in concert, information that would have taken time to untangle using one-sided thinking can often be grasped in an instant.

Make Your Memory Stronger

Thinking with your whole brain virtually doubles the odds of remembering what you've just learned. Memories that would normally be stored in only the left side of the brain are now filed in the right side as well. Indeed, Allan Paivio from the University of Western Ontario, using what he calls "dual coding," has concluded that pictures are easier to remember than words and that information is more readily recalled when it is learned as both pictures and words.¹ Thus, if you make both a verbal and a visual effort to recall something you've learned, your memory will have two places in which to search for the information instead of just one.

EXTRACTING MEANING FROM PICTURES

When you read a paragraph, you're cracking a code. That code is the English language, and its message is the meaning you extract from words, sentences, and paragraphs. Although we spend a great deal of time decoding

¹ Allan Paivio, Mary Walsh, and Trudy Bons, "Concreteness Effects on Memory: When and Why?" *Journal of Experimental Psychology: Learning, Memory and Cognition* 20, no. 5 (1994): 1196–1204.

language, most of the codes around us are visual codes. We can decode a smile, for example, and know how its meaning differs from that of a frown. Visual materials in textbooks use codes as well to supply messages that are often as important as the meanings contained in sentences and paragraphs. For that reason, they must be read every bit as carefully. And like reading a paragraph, reading a visual simply means extracting its message.

The OPTIC system enables you to extract the message from a variety of visuals. If your goal is the analysis of a graph, you will need to understand the language of that graph before you use the OPTIC system.

Use the OPTIC System

Many students mistakenly give visuals only a quick glance or even skip over them entirely. But these graphic materials should be scrutinized as carefully and as systematically as paragraphs. The OPTIC system will help you take an organized approach to this task.

The five letters in the word OPTIC (which means “pertaining to the eye”) provide you with a system for remembering the five steps for analyzing a visual.

O is for *overview*.

P is for *parts*.

T is for *title*.

I is for *interrelationships*.

C is for *conclusion*.

1. Begin by conducting a brief *overview* of the visual.
2. Then zero in on the *parts* of the visual. Read all labels, and note any elements or details that seem important.
3. Now read the *title* of the visual so you're clear on the subject it is covering.
4. Next use the title as your theory and the parts of the visual as your clues to detect and specify the *interrelationships* in the graphic.
5. Finally, try to reach a *conclusion* about the visual as a whole. What does it mean? Why was it included in the text? Sum up the message of the visual in just a sentence or two.

Learn the Language of Graphs

You are most likely to encounter three general types of graphs: circle graphs, bar graphs, and line graphs. The purpose of a circle graph is unique, whereas bar and line graphs perform the same basic function.

Decode the Circle Graph The purpose of a circle graph, also known as a pie chart, is to show proportionally the relationship of parts (slices) to a whole (the pie). Although these graphs are relatively rare in highly technical books, they regularly appear in newspapers as well as in textbooks where the topic is something other than mathematics or science. The popularity of the circle graph is mainly due to its simplicity. In most cases, you can tell at a glance the proportions the graph illustrates—that is, the various-sized slices of the pie. For example, in Figure 13.2, the circle graph gives you a clear picture of the population distribution in the United States.

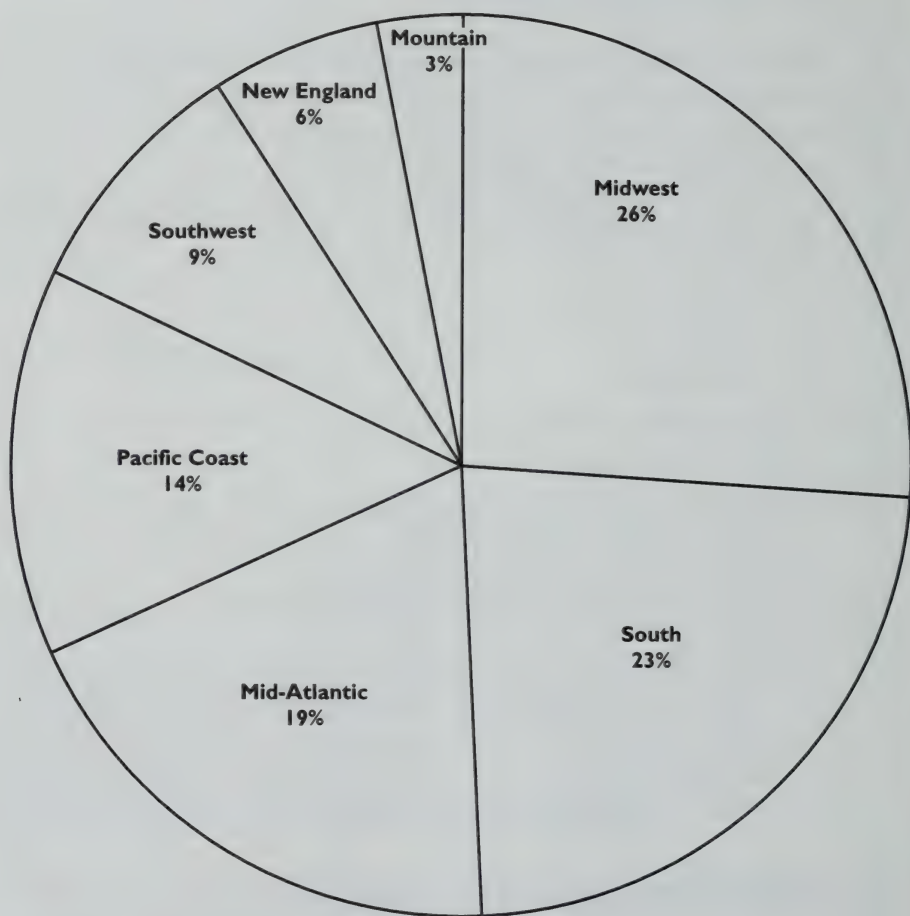


FIGURE 13.2 U.S. Population Divided by Region

Circle graphs (pie charts) show the relationship of several parts to a whole.

Decode Bar and Line Graphs The purpose of bar and line graphs is to illustrate the relationship of a set of dependent variables to a set of independent variables. *Variables* are numbers that can change. For example, the number we use to refer to the year is a variable. It changes every twelve months, when it increases by one. Population is another variable. It changes when someone is born or dies, when someone becomes a citizen, or when someone leaves the country. Years and dates in general are called *independent variables* because they change on their own. The population of the United States does not influence the fact that every 365 to 366 days we begin a new year. Quantities such as population are called *dependent variables* because their change occurs in relation to another variable, such as the year. For example, we measure the changes of U.S. population every ten years when the census is taken.

Although bar and line graphs both operate in the same basic way (showing how a dependent variable such as population increases or decreases in relation to an independent variable such as the year), each takes a slightly different approach. Bar graphs (see Figure 13.3) focus on specific changes; line graphs (see Figure 13.4) illustrate long-term trends. One way to visualize this distinction is to think of bar graphs as snapshots and line graphs as movies. If you were to take successive snapshots of a long jumper, you would have a series of photographs showing successive stages of the jump. If you were to film the same jump with a movie camera, you'd have a continuous record of the entire jump. Figure 13.5 illustrates this idea.

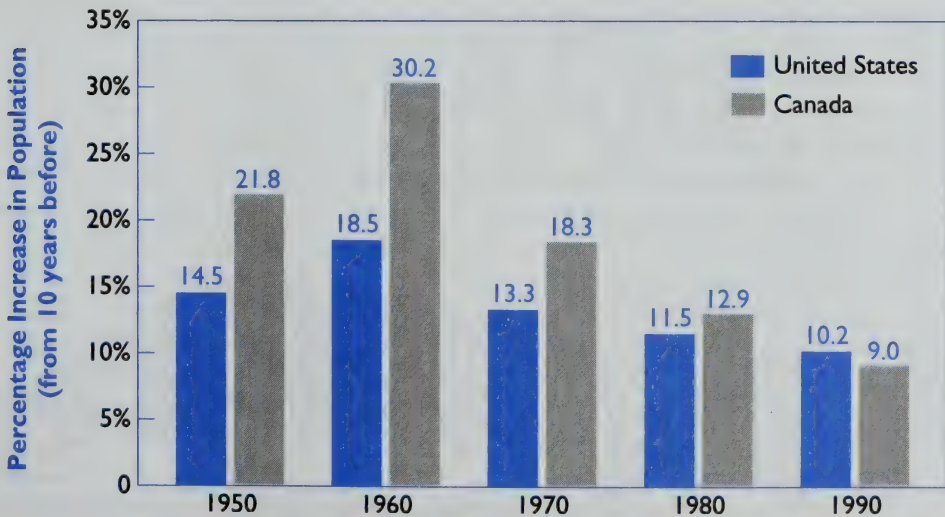


FIGURE 13.3 Population Growth in the United States and Canada, 1950 – 1990

Bar graphs show sizes of individual items and illustrate comparisons.

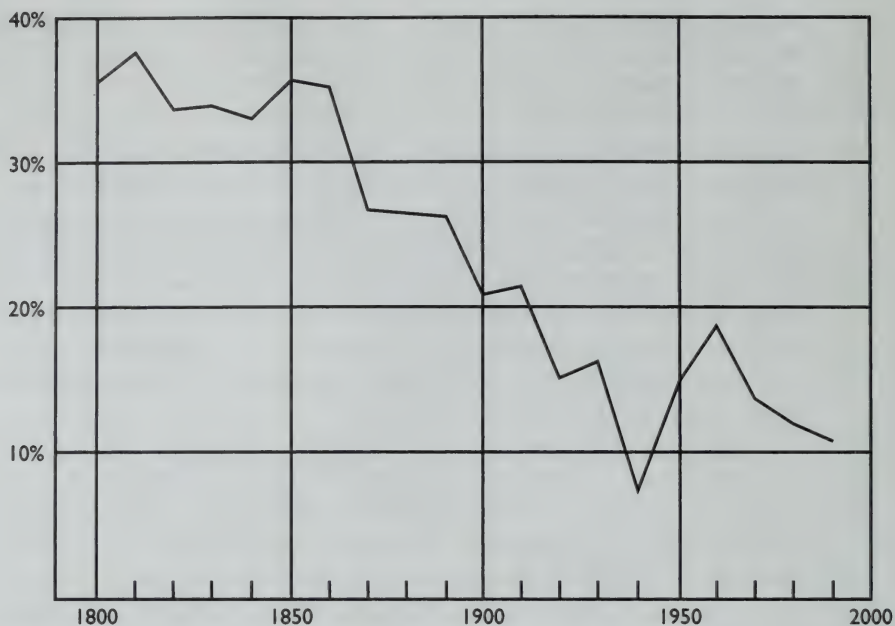


FIGURE 13.4 Percentage Increase in U.S. Population, 1800 – 1990

Line graphs show long-term trends in data.

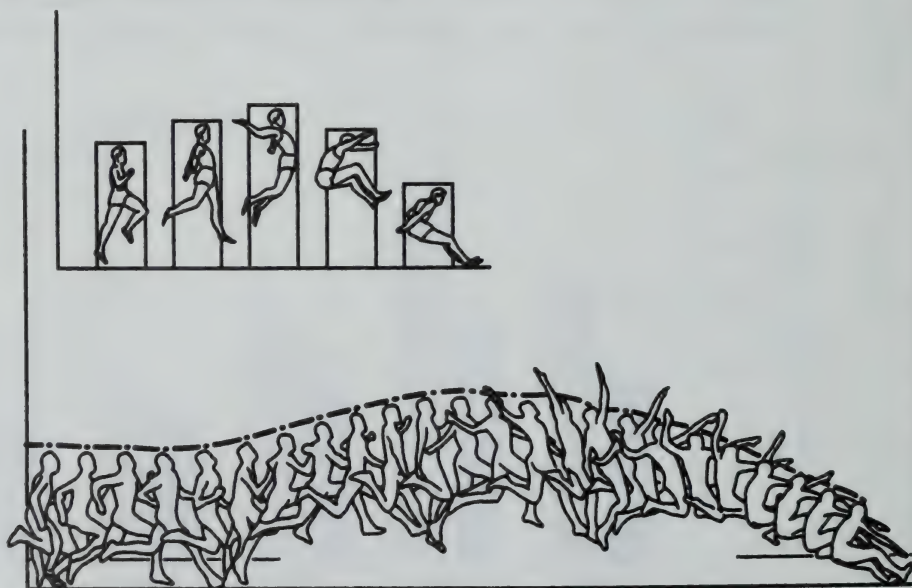


FIGURE 13.5 Snapshots Versus Movies: Bar Graphs and Line Graphs

A bar graph can be compared to a set of snapshots, whereas a line graph is more like a movie. Track and Field Omnibook, *Fourth Ed.*, 1985, by Ken Doherty, Tafnews Press (Track and Field News), Mountain View, CA. Reprinted with permission.

Like snapshots and movies, each type of graph has its strengths. Bar graphs are good for comparing the individual sizes or amounts of items, and they provide clear comparisons of several sets of data at once. Line graphs are useful for showing changes in data over long periods of time. For instance, if you wanted to examine the country's population increase over a brief period of time or if you wanted to compare it with the population of another country, then you would probably use a bar graph. Figure 13.3 shows that the growth in U.S. population was relatively steady from 1950 through 1990, whereas Canada's population growth surged during the 1950s and 1960s. But if you wanted to show the percentage increase in U.S. population since the eighteenth century, a line graph would be a better visual. Figure 13.4 shows that the growth in U.S. population has generally slowed since 1800.

Regardless of whether the graphic is a circle, bar, or line graph, once you understand the language of the particular graph, you can methodically extract its meaning in the same way you would with a picture or diagram—by using the OPTIC system. Figure 13.6, on pages 332–333, shows a graph that has been analyzed using this system.

EXPANDING UNDERSTANDING WITH GRAPHICS

We now know that reading a visual means studying a diagram or a graph and turning its message into a sentence or two. When you write in pictures, you simply reverse the process. You convert the sentences you've read or heard into a diagram or graph. If the information you encounter is concrete, then your task is fairly simple. For instance, you can turn a description of a computer modem into a diagram by using that description as directions for your sketch (see Figure 13.7). If, however, the ideas you read or hear are more abstract, such as information about the characteristics of amphibians, then your approach needs to be a bit more involved. Instead of drawing sketches of the animals, which doesn't tell you much about their characteristics, you need to create a concept map. Although your approach to abstract ideas is different from your approach to concrete ones, your goal is the same: to turn something you can read into something you can see (see Figure 13.8).

Add Illustrations to Your Notes

As you read your textbook or go over your lecture notes, don't just jot down the key ideas in words; sketch some of them as well. In some subjects

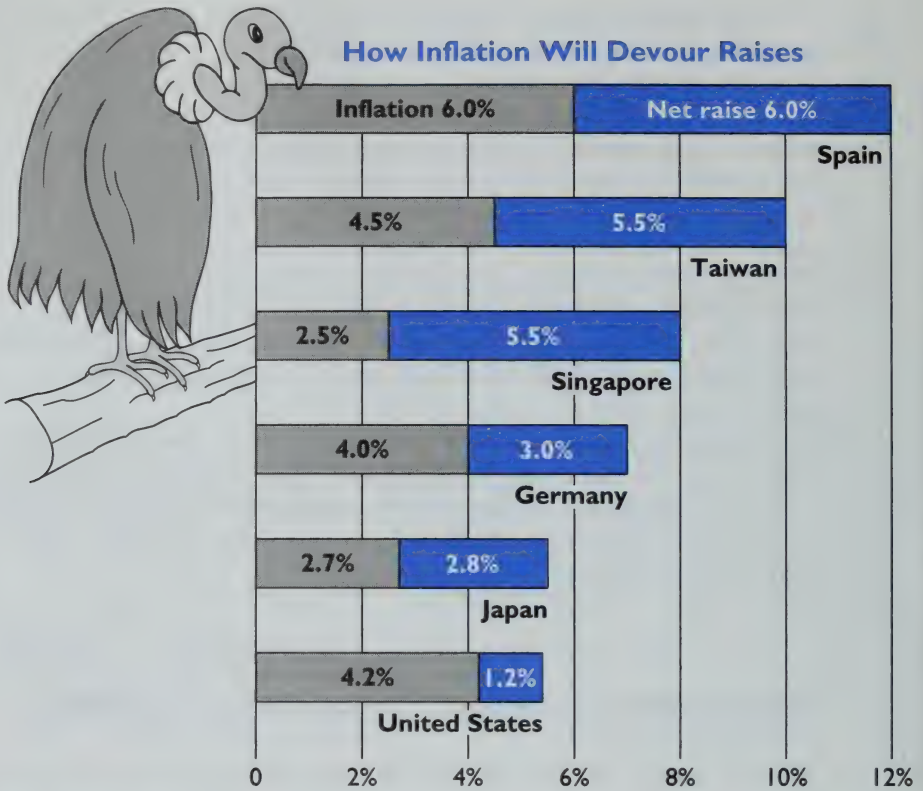


FIGURE 13.6 Using the OPTIC System to Analyze a Graph

Source: FORTUNE, © 1991 Time Inc. All rights reserved.

this sketching will come naturally. Science courses, for example, are full of information that can be drawn. The parts of a one-celled organism or the connections in a computer network are much easier to understand if you put little diagrams of them in your notes. Sometimes the drawing is done for you. If the instructor puts a sketch on the board or the textbook author includes diagrams in the chapter, add these pictures to your notes in the same way that you would jot down important examples. When a drawing doesn't exist, make one of your own.

A history course may not feature easily drawn elements, but it does include plenty of concrete data that can be translated into picture form. A series of important dates, for example, can be turned into a timeline, and individual historical facts can be visualized almost as easily.

OVERVIEW

A bar graph with a vulture in the corner and six bars moving from longest to shortest with each bar divided into plain and hatched lined sections and marked with percentages.

PARTS

- The six bars represent six countries: Spain, Taiwan, Singapore, Germany, Japan, and the United States.
- Percentages run horizontally at the bottom of the graph—from 0% to 12%—and represent percentage increases in salaries.
- The total length of each bar represents raises, the shaded section stands for the rate of inflation, the colored part of the bar is the net raise—the raise that remains after inflation.

TITLE

* “How Inflation Will Devour Raises”

The word *devour* seems to imply that inflation has a major impact on raises. The vulture is being used to make the point more dramatic and perhaps make the graph more interesting.

INTERRELATIONSHIPS

- Spain appears due for the largest raises, while the United States will be receiving the smallest.
- Half of the raises in Spain will be “devoured” by inflation, while roughly four-fifths of American raises will be lost to inflation.
- Of those countries listed, Spain has the highest rate of inflation (6%), while Singapore (2.5%) has the lowest rate.
- The net raises in Taiwan and Singapore are identical (5.5%), even though their rates of inflation are very different (4.5% and 2.5%).

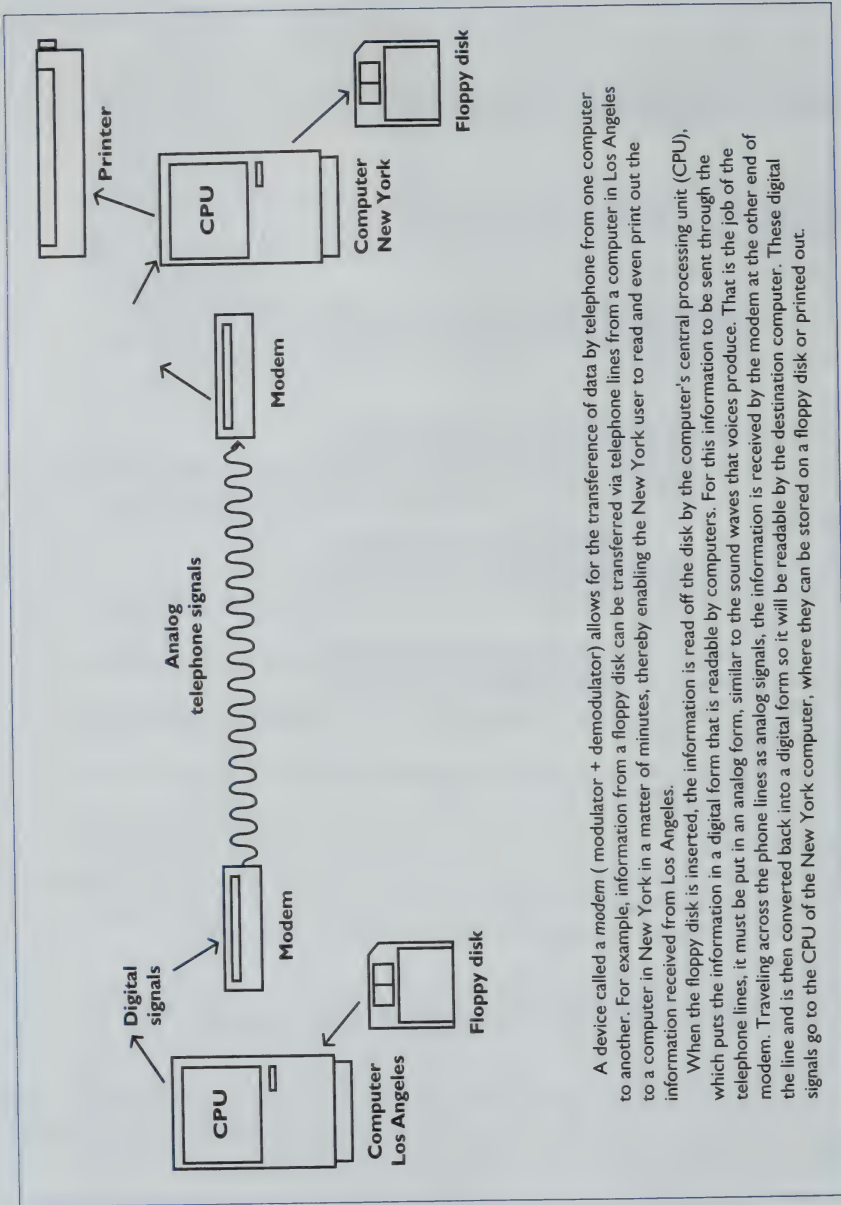
CONCLUSION

With the exception of Singapore, inflation will devour a large portion—close to half and more—of anticipated raises. The United States is the hardest hit of all the countries represented in the graph, retaining only 1.2% of a 5.4% raise after inflation.

FIGURE 13.6 Using the OPTIC System to Analyze a Graph—*continued*

Here is an example of how words can be converted into a picture. The following paragraph describes an experiment conducted by the English physicist and chemist Michael Faraday (1791–1867):

In 1831, Michael Faraday, one of Britain’s greatest scientists, did the experiments which completely demonstrated the close relationship between electricity and magnetism. One of his famous experiments was to take a coil of wire and connect the ends across an instrument capable of measuring tiny currents. By quickly pushing a bar magnet through the coil he was able to produce a small current in the coil and to measure that current. What he was really doing was to change the strength of the magnetic field in the coil by



A device called a *modem* (modulator + demodulator) allows for the transference of data by telephone from one computer to another. For example, information from a floppy disk can be transferred via telephone lines from a computer in Los Angeles to a computer in New York in a matter of minutes, thereby enabling the New York user to read and even print out the information received from Los Angeles.

When the floppy disk is inserted, the information is read off the disk by the computer's central processing unit (CPU), which puts the information in a digital form that is readable by computers. For this information to be sent through the telephone lines, it must be put in an analog form, similar to the sound waves that voices produce. That is the job of the modem. Traveling across the phone lines as analog signals, the information is received by the modem at the other end of the line and is then converted back into a digital form so it will be readable by the destination computer. These digital signals go to the CPU of the New York computer, where they can be stored on a floppy disk or printed out.

FIGURE 13.7 A Diagram Based on Text Information

As a class of animals, amphibians may be the most (harmless) creatures on earth. (Frogs, newts) and (salamanders) are all members of the amphibian family. Unlike (insects) and (other animals), amphibians pose (no real threat) to (crops) or (humans). Even the food they eat is of no use to us. Most amphibians exist on a diet of (small insects) and (plants).

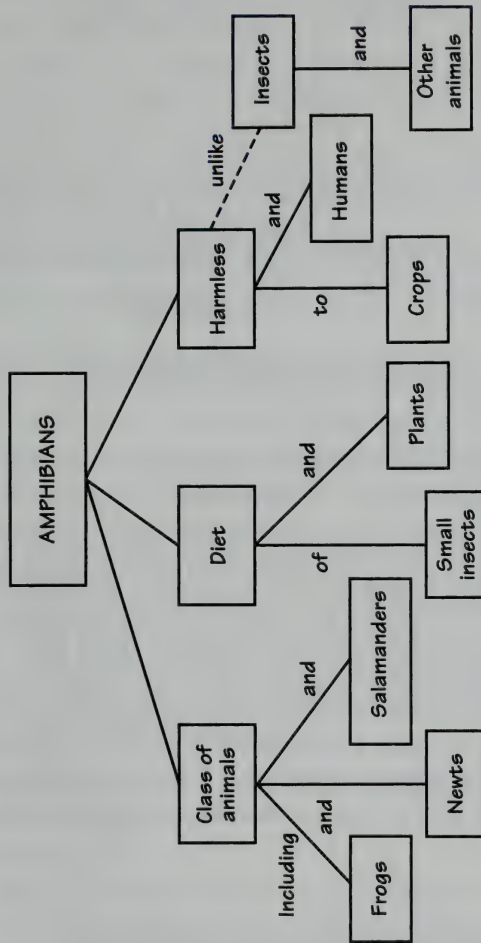


FIGURE 13.8 A Concept Map of Text Information

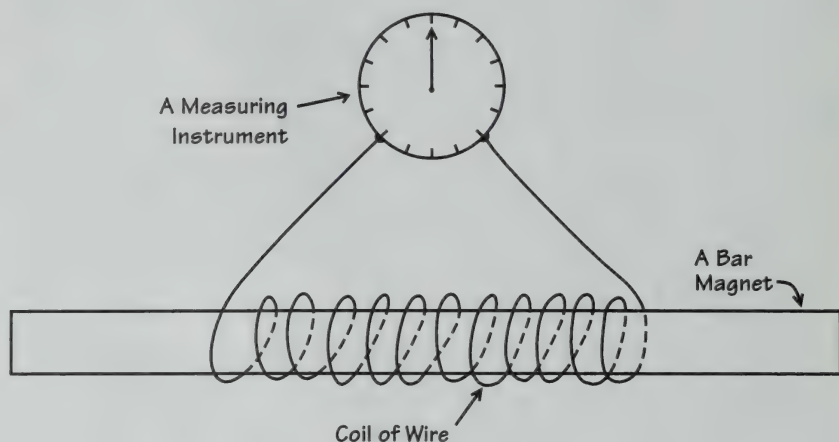


FIGURE 13.9 A Descriptive Paragraph Made Visual

inserting and removing the magnet. The more rapidly he changed the field the more current he could generate.²

Figure 13.9 is an example of how one student converted this descriptive paragraph into a diagram, which helped the student not only to understand the described process but to visualize and remember it as well. If a question about Faraday's experiment appeared on a test, it is not hard to imagine how well a student with this picture in mind would do.

You don't have to be Michelangelo or Leonardo da Vinci to draw diagrams in your notes. The important point is to tap into the right side of your brain. With your full mind at work, you will increase your brain power, regardless of whether your drawing looks like doodling or a priceless work of art.

Turn Abstract Ideas into Maps

Abstract ideas don't lend themselves quite as easily to diagrams as concrete ideas do. For example, you can draw a rough sketch of farmland, a field worker, and a tractor, but how would you diagram economic production, a procedure that involves all three? That's where a concept map comes in. Concept maps are used to diagram abstract processes and relationships. Drawing a concept map based on a set of abstract ideas is similar to drawing a road map based on a set of hard-to-follow directions. And in both

²J. D. Jukes, *Man-Made Sun* (New York: Abelard-Schuman, 1959), p. 33.

cases, the map that results will make the idea easier to visualize, understand, and remember. Here are the steps for mapping a textbook passage:

1. Determine the topic of the passage you are planning to map. Put the topic at the top of a sheet of paper and circle it.
2. Go back to the passage and circle or list the concepts involved.
3. Find the two to five most important concepts from your list. These are the key concepts. List them on your map in a row beneath the circled topic. Circle these key concepts as well.
4. Cluster the remaining concepts under the key concepts to which they relate. Add them to your map beneath the key concepts they support, and then circle these new concepts.
5. Draw lines connecting related concepts. Along each line, you may want to specify the relationship that connects the concepts.

Master the Map Drawing a concept map, like taking notes, does a great deal to help cement important ideas and concepts in your memory. And like your notes, your maps can be mastered. Although there are several systems for mastering your map, the simplest and most effective way is to look it over carefully and then, without peeking at the original passage, write a short summarizing paragraph explaining the key concepts and how they relate. The result is like writing your own textbook. You start out with the same concepts the textbook uses, but the words that result are your own instead of the author's. Figure 13.10 shows such a map and its summary paragraph.

Concept maps are flexible study aids. They don't lock you into just one method or approach. Here are some additional ways you can use a concept map to improve your studying.

Use the concepts for recitation. Take one circled concept from your map and explain out loud and without looking at the rest of the map how it relates to the map as a whole.

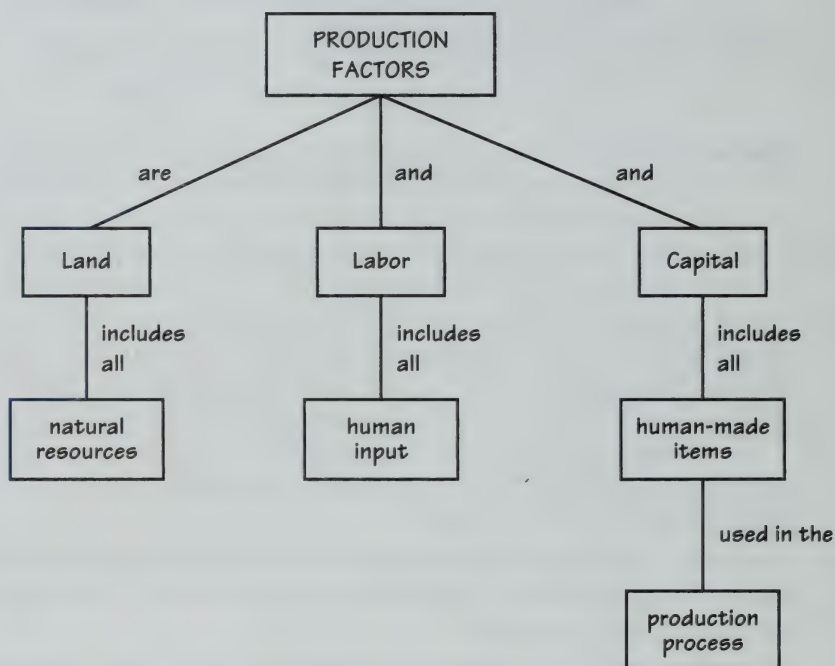
Add to your map. New ideas frequently connect with old information. Take a moment to think about how the concepts in your map relate to ideas you already know. Add the appropriate old ideas to your map, and connect them to what you've just learned.

Redraw your map. There's no right or wrong way of drawing a concept map. The same information can be mapped in a number of ways. Look over your original map and see if you can organize the concepts a little differently. Looking at the information from a different angle often makes some of the concepts a little clearer. Also, creating a second map of the same information means that the concepts will be stored in your memory an additional time.

Use Maps for Summaries Although a map of every concept in a chapter would be huge and a concept map for even a small book would likely

Textbook Passage

There are three factors of production: land, labor and capital. Land includes all natural resources, labor all human inputs, and capital all human-made items used in the production process.

Concept MapSummary Paragraph

Land, labor, and capital are the three factors of economic production. Land refers to all natural resources, labor means the input from humans, and capital refers to any human-made items that are used in the production process.

FIGURE 13.10 Mastering a Concept Map

be about the size of a billboard, you can use mapping to *summarize* the key concepts from chapters, articles, and books. The procedure for summarizing information with a concept map is identical to the one you just followed for mapping a single paragraph from your textbook or section from your notes, except that you cover more ground. Instead of containing information from one paragraph, a summary map may draw from dozens of paragraphs. For this reason, summary maps do not contain as much detail as maps created for more specific sections. The maps at the beginning of each chapter in this book provide good examples of summary maps. Notice how they include the most important concepts from the chapter they illustrate.

Use Maps as Planning Strategies Concept maps can be used to plan a paper or an oral report. First write the topic you've chosen at the top of a blank sheet of paper. Then, after you have done a bit of preliminary research and have come up with several main concepts, add these to your map, and connect them with lines to your topic. Finally, fill out your map with any supporting ideas you've acquired, making sure to cluster them under the main concepts to which they refer. Once again, draw connecting lines to show how each piece fits into the puzzle. Here is the step-by-step procedure for mapping a paper or an oral report:

1. Do some preliminary research on your subject.
2. Write your topic at the top of a blank sheet of paper.
3. Add two to five main ideas that you plan to cover, and link them to the topic on your map.
4. Cluster any subideas under the main ideas that they support. Link them with lines.
5. Survey your map in order to decide whether its branches are evenly developed.
6. If your map seems lopsided, rearrange it or add information so that all its branches are balanced.
7. Use your map as a guide to do in-depth research on the concepts you plan to cover. Add to your map if necessary.

At the very least, your finished concept map can function as an outline, supplying you with all the main ideas and subideas you plan to include in your paper or oral report. In addition, the map can be used as a guide to help you do your more detailed research as systematically as possible.

Unlike a conventional outline, a map enables you to see your outline instead of just reading it. In general, a well-organized report looks fairly symmetrical when you map it. If your map has a lopsided appearance, it may mean that your report needs to be more evenly balanced. Adding some concepts or clustering your existing topics in a different arrangement should

do the trick. Once you're happy with the look of your map, it can serve as a plan for further research.

THINGS TO WATCH OUT FOR

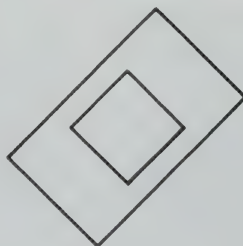
Factual data—especially statistics—can be placed in graphic formats that distort the data. Unscrupulous people may use this device to strengthen arguments or make data appear favorable to their cause. The book *How to Lie with Statistics*³ exposes some of the devious tricks that are used and is also fun to read. For example, you should be wary of the word *average*, and you should try to find the highest and lowest figures that went into each average. Two companies may have an average salary of \$29,000. But if the range of salaries in one company is from \$6,000 to \$90,000, whereas in the other company the range is from \$20,000 to \$35,000, then the salary policies of the two companies are quite different.

Don't be overly impressed by the steepness of the lines in graphs. Look at the side of every graph to find the scale—the value of each increment. Units of \$100 will make a line much steeper than units of \$1,000. Always convert what you see into words; otherwise you'll remember the steepness or flatness but not the real information that is being presented.

Remember that visual relationships can be tricky. The frame around a diagram can actually change the way you see the diagram. For example, this is a diamond-shaped figure:



But notice that when the same figure is placed in a frame,



³Darrell Huff, *How to Lie with Statistics* (New York: Norton, 1993).

it looks like a square. The size and shape of a chart or graph can also affect what you see. Data that may be quite neutral or ordinary can be made to appear startling by the form and scale of the graphic. If you read graphics carefully, you'll see them in the proper way, rather than as someone else may expect—or want—you to see them.

SUMMARY

How can thinking visually broaden your mind?

*adding pics, increases
understand & remembering*

Because the mind's interpretation of visual images occurs on the right side of your brain, thinking in pictures adds another dimension to thought and increases your chances of understanding and remembering information.

What is the OPTIC system?

*Evaluating a visual
overview illus
To constituent part
read title
det. interrelationship
arrive @ con*

The OPTIC system is a set of steps for systematically evaluating a visual. To use the system, overview the illustration, identify its constituent parts, read its title, determine the interrelationship among all these components, and arrive at a conclusion.

What is meant by the "language of graphs"?

The phrase indicates that graphs, like paragraphs, communicate key ideas. Although all graphs share some similarities, the most common graphs—circle, bar, and line graphs—convey their messages in slightly different ways.

What is the purpose of a circle graph?

*ill. set of parts
technical articles
& books*

The purpose of a circle graph, or pie chart, is to illustrate how a set of parts (slices) fits together to form a whole (pie). The easy readability of a circle graph makes it extremely useful for less technical articles and books.

What is the purpose of bar and line graphs?

cause & effect

Both graphs are primarily designed to illustrate the relationship between a set of dependent variables and a set of independent variables. In most cases, this illustration follows the form of cause and effect.

How do bar and line graphs differ?

*Bar: specific
Line: broad.*

Bar graphs usually show a few specific increases or decreases, whereas line graphs provide a broader view and are more likely to reveal an overall trend. The difference

Snapshots
movies

How can you use visuals to expand your understanding?

better understanding

How can you master information in a concept map?

bas = for reciting, explaining
or writing from memory
link ideas in map that
you already know

How can concept maps be used as summaries?

Most important
arrange in map } of art.
chap.
or book

How do maps help you in preparing for a paper or oral report?

organized
clearer
step-by-step game
Plan

between bar graphs and line graphs is similar to that between snapshots and movies.

Drawing a picture or diagram to accompany written information often makes what you've read easier to understand. If the words are concrete, a picture usually helps. If they're more abstract, you may want to use a concept map instead.

Use each concept as a basis for reciting, explaining, or writing from memory how the concept relates to the map as a whole. You may also want to link the new ideas in your map to ones you already know or redraw your map to gain a different view of the information.

By selecting the most important concepts and arranging them in a map, you can create a convenient summary of an article, a chapter, or an entire book.

Arranging the important concepts you want to write or talk about in the form of a map provides you with a visual outline that makes the organization of your paper or oral report clearer. The same map can be used as a step-by-step game plan for doing your research.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. If you commit facts and ideas to memory through words only, you are using only half of your _____.
wordpower brainpower intuition
2. The left side of the brain tends to be _____.
ethical creative logical
3. Mapping can benefit students who are visually _____.
impaired oriented deficient

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-------------------------|---|
| <u>C</u> 1. Memory | a. Idea of storing information as both words and pictures |
| <u>W</u> 2. Words | b. Method for systematically analyzing graphic materials |
| <u>P</u> 3. Pictures | c. Strengthened when both sides of the brain are used |
| <u>b</u> 4. OPTIC | d. One way to think of the function of line graphs |
| <u>A</u> 5. Dual coding | e. Normally fall under the jurisdiction of the brain's right side |
| <u>g</u> 6. Snapshots | f. Usually fall under the jurisdiction of the brain's left side |
| <u>d</u> 7. Movies | g. One way to think of the function of bar graphs |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- T 1. In general, bar and line graphs illustrate the same relationship.
- T 2. Line graphs can provide an effective illustration of long-term trends.
- T 3. The OPTIC system can be used with both pictures and graphs.
- T 4. Artistic ability isn't necessary for drawing pictures to help you study.
- F 5. Unlike conventional notes, concept maps cannot be recited.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

- Reading a paragraph or analyzing a visual can be considered
 - left-brain thinking.
 - b cracking a code.
 - identical endeavors.
 - right-brain thinking.
- Circle graphs are
 - popular in newspapers.
 - simple to understand.

- c. rare in technical books.
 - ☒ d. all the above.
3. Independent variables include
- ☒ a. years and dates.
 - b. population sizes.
 - c. words.
 - d. pictures.
4. The subject of a concept map is usually
- a. concrete.
 - b. complex.
 - ☒ c. abstract.
 - d. simple.
5. Summary maps should be drawn with
- ☒ a. less detail.
 - b. black marking pen.
 - c. independent variables.
 - d. concrete concepts.
6. When used with a paper or an oral report, a map can function as
- a. a guide for research.
 - b. a visual outline.
 - c. a taking-off point.
 - ☒ d. all of the above.

Short answer. Supply a brief answer for each of the following items.

1. Explain the difference between the left and right sides of the brain.
2. Outline the steps involved in the OPTIC system.
3. What is the difference between line graphs and bar graphs?
4. How do you master a concept map?

THE WORD HISTORY SYSTEM

congregation con'-gre-ga'-tion *n.* 1. A body of assembled people or things; a gathering. 2. Those who regularly worship at a specific church or synagogue.

Congregation: *a flock*



The symbolism so beautifully expressed in David's twenty-third Psalm is fully justified by the origins of our words *congregation* and *pastor*. Latin *grex, gregis*, means "flock" or "herd" and is the basis for the word *congregare*, meaning "to gather into a flock." Derived from this is the Latin *congregatio*, which is taken into English as *congregation*. The word *pastor* carries out the same symbolism. Latin *pascere* means "to pasture," "to feed." The past participle *pastum* gives Latin *pastor*, "a shepherd" or "one who has the care of flocks." Later, the figurative meaning developed, "a keeper of souls" or "minister of the church." The two words, therefore, preserve the symbolism of the shepherd and his flock as applied to the *pastor* and his *congregation*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

We have lived through the age of big industry and the age of the giant corporation. But I believe that this is the age of the *entrepreneur*.

—Ronald Reagan (1911–), fortieth president of the United States

1. *entrepreneur* entertainer computer impresario
whiz undertaker

The executive's chief business is to organize, *deputize*, and supervise.

—George Ripley (1802–1880), American literary critic

2. *deputize* enforce delegate regulate

Those who make the worst use of their time are the first to complain of its *brevity*.

—Jean de La Bruyère (1645–1696), French writer and moralist

3. *brevity* briefness dullness wastefulness

Nothing is given so *profusely* as advice.

—François, Duc de La Rochefoucauld (1613–1680), French writer

4. *profusely* expertly belatedly abundantly

MANAGING TEST ANXIETY

The will to win is nothing without the will to prepare.

—JUMA IKANGAA, MARATHONER

A walk into an exam room can be a frightening journey into the unknown. But if you're prepared before you sit down to take your test, any fear you initially feel will evaporate, and any anxiety will subside. This chapter explains how you can manage test anxiety by:

- Preparing yourself academically
- Preparing yourself mentally

MANAGING TEST ANXIETY

Preparing Yourself Academically

Start Early

Stay on Top
of Your
Coursework

Organize
Yourself

Cram
Systematically

Find Out
About
the Exam

Get
Acquainted with
the Test Site

Maintain
a Positive
Attitude

Preparing Yourself Mentally

The cure for test anxiety is a simple but powerful one: preparation. Advance preparation is like a fire drill: It teaches you what to do and how to proceed, even in a high-stress situation, because you've been through the procedure so many times that you know it by heart. To manage the anxiety that often arises at test time, you can prepare yourself both academically and mentally.

PREPARING YOURSELF ACADEMICALLY

To be prepared academically, start early, stay on top of your coursework, and organize yourself and your studying plan. Even if you're forced to cram for a test, do so as sensibly and methodically as you would if you had no time constraints.

Start Early

The pressure's almost nonexistent at the start of a new term. Take advantage of this calm before the storm. Get a head start in a course by picking up your textbooks, looking over your syllabus, and familiarizing yourself with your school's tutoring services.

Pick Up Your Textbooks Early Many students wait until the last minute, sometimes even until after the first assignment, before they pick up their textbooks. This is a common mistake. There's no reason to wait this long and every reason to buy your books as soon as you are registered for a course.

Obtaining your books in advance allows you to look through the text in a leisurely manner and get a sense of where the book and the course will be headed. Students who buy their books late in the game seldom have the opportunity to go through each book systematically, surveying the table of contents, reading the preface and the introduction, and flipping through the book as a whole. With this early start, you build a foundation of understanding.

Read Your Syllabus One of the most frequently wasted resources in a college-level course is the *syllabus*, or course plan, usually handed out by the instructor during the first week of class. In the same way that surveying your textbook gives you a sense of the book as a whole, reading your syllabus from start to finish at the earliest opportunity provides you with a valuable overview of the course and makes preparing for tests much easier.

At times a syllabus can be an unexpected source of information. A few years ago, a student complained to the instructor that a paragraph-long essay question on the final exam was unreasonably difficult and totally unexpected. The instructor calmly pulled out a copy of the syllabus and pointed to the bottom of the page as the student's jaw dropped. The "unexpected" question had been printed on the last page of the syllabus and had been handed out at the beginning of the semester! The only problem was that the student hadn't bothered to read it.

Get Help if You Need It As soon as you realize you're going to have trouble with one of your courses, get help. Don't struggle through a course and wait until the last minute before seeking tutoring help. By then the tutors may all have been taken.

Before the semester even begins, find out where your campus tutoring service is located and how to arrange for a tutor when you need one. New students can usually pick up this information during orientation. Keep it handy; then if you find that you are struggling with a course, you can arrange for a tutor without delay.

Stay on Top of Your Coursework

Your preparation for exams must begin on the first day of classes and continue throughout the entire semester. To be able to focus your mind and your time on an upcoming exam, the decks must be clear—that is, your coursework must be up to date. If you have to spend valuable time getting caught up, you can seriously endanger your performance on the exam. If you stay on top of your assignments throughout the semester—by taking notes as you read or listen and by mastering those notes at the earliest possible opportunity—they won't come back to haunt you when it's time to study for finals.

Take Notes In most tests you are called on either to recognize or to recall a great deal of information. You can't possibly remember everything you came across in your textbook or heard in lectures during a span of several weeks. The only way to hold on to the information that will guarantee sufficient preparation for a test or exam is by taking notes.

The Cornell note-taking format, as we've seen, provides an effective framework for recording the ideas, details, and examples gleaned from both lectures and textbook assignments. The Silver Dollar System (see Chapter 5) enables you to distill that information down to its most important ideas.

If you make a regular habit of taking notes in the Cornell format for both lectures and textbook assignments and singling out the key ideas from the notes you have taken, you'll accumulate a valuable storehouse of knowledge, and you'll have an excellent start in your preparation for upcoming exams. The next step is to master the notes you have taken.

Master Your Material The key to mastery is recitation (see Chapter 5), which is the most powerful method known to psychologists for embedding facts and ideas in your memory. If you took notes using the Questions-in-the-Margin System (see Chapter 11), writing the questions in the left-hand margin enabled you to recite the information you had jotted down on your note sheet. You can then take your recitation a step further by covering your notes in the wide column and using the questions to help yourself recall the information. This traditional method of recitation works best when you do it out loud, from memory, and in your own words. Remember: If you can't answer the questions now, you haven't learned the material, and you won't be able to recall it later during an exam.

Organize Yourself

The work you put into preparing yourself academically by starting early and by keeping up with your classes and assignments can be put to its best possible use if you make it a point to organize both your time and your notes.

Organize Your Time with Schedules Scheduling is important throughout the term. Three-part scheduling plans (explained in Chapter 2) allow you to set aside times for reviewing material so that you won't get caught off-guard by a quiz or test.

As you near the end of a term or semester, scheduling your time becomes even more crucial. If you haven't been using schedules, now's a good time to start. If you have been, you probably feel on top of things already. In either case, it's a good idea to organize your time with a homestretch schedule especially designed to help you tie up any loose ends and get you through that all-important last week before exams begin. When exam week arrives, devise another schedule that specifies when each of your tests is and that enables you to schedule time for meals, sleep, and recreation, which are particularly crucial during exam week.

Make up a "homestretch" schedule. Use the format shown in Figure 14.1 to make up a homestretch schedule. (This schedule uses the same grid discussed in Chapter 2.) Start by filling in the time blocks that will be taken up by meals, sleep, job, and recreation. Next fill in your classes. Do not miss

classes for any reason; you will want to hear the instructors' answers to students' questions about exams. Finally, fill in the time you will need to complete term papers and other assignments. Make sure you get them done before exam week. You don't want unfinished business to interfere with your studying or distract your thinking during exams.

Even after you've scheduled time for all your pre-exam obligations, you will likely find that some time is available toward the end of the week. Use it to study for your exams. Fill in the exact study times and subjects. Instead of writing "Study" in the time blocks, you are wise to write exactly what you plan to study: "Study economics, chaps 1 to 10" or "Summarize sociology notes." Make a schedule that you'll be able to follow, and then be sure to follow it.

	M	Tu	W	Th	F	Sat	Sun
7:00							
8:00							
9:00							
10:00							
11:00							
12:00							
1:00							
2:00							
3:00							
4:00							
5:00							
6:00							
7:00							
8:00							
9:00							
10:00							

FIGURE 14.1 Format for the "Homestretch" Schedule

Use an exam-week schedule. Toward the end of the week before finals, make up a schedule for exam week. Fill in the times for your exams and for your meals, rest, and recreation. Remember that you must be in tiptop shape mentally, emotionally, and physically if you are to do your best on the exams. Eating the right food, getting the right amount of sleep, and exercising regularly are all important tools not only for maintaining good health but also for managing the sort of stress all too common around exam time. Therefore, don't skip meals, sleep, or recreation in an effort to squeeze in more studying time.

By finals' week, the bulk of your preparation should be completed. Leave a block of time immediately before each exam to review important information. The less time you allow between this last review and the exam, the less forgetting will take place. Review calmly and thoughtfully, and carry this calm, thoughtful behavior right into the exam room.

Organize Your Notes with Summary Sheets The best way to organize your notes before an exam is by consolidating them into a set of summary sheets (a highly concentrated version of your notes) and then reciting those sheets as you would your regular notes.

How can you reduce your notes so dramatically? You can do it by being selective. Although you may have been able to master the main ideas and subideas after each lecture or reading assignment, combining all this information and remembering it are not easy tasks. To recall all the lectures and readings without overloading your memory, you should limit your notes to only a handful of truly important ideas from each lecture and reading.

Why go through the process of making up summary sheets? First, it enables you to review and add to the notes you took throughout the semester and thereby increase the information you have retained. Second, it produces a superconcentrated set of notes that you can use as a refresher immediately before the exam. Finally, it helps you categorize your information under specific headings and thus improve your ability to retrieve it from your memory during the exam.

Make regular summary sheets. If you have used the Silver Dollar System to pick out the main ideas and subideas from your notes, reducing those notes one step further should be relatively simple. Include only those notes marked with a \$ in your summary sheets. If you haven't used the Silver Dollar System, you can narrow your notes all at once by employing it now, although the process will be time consuming.

Figure 14.2 provides an example of a standard summary sheet. It is indistinguishable from a regular Cornell note sheet except that this sheet contains the most important ideas from several lectures, rather than just one, compressed into the same amount of space.

Steps in Writing

What are four elements of college writing?

Writing must have: basic premise, logical development of ideas, support in paragraphs, good word choice

What are steps in prewriting?

Prewriting

Brainstorm about a subject - generate ideas
Narrow to a topic - use list or concept map
Focus on a basic premise - ask a meaningful question that makes a point
Plot a pattern - organize points into a framework

What is the basic structure?

Writing

Structure - use introduction, body paragraphs, and conclusion
- write body first

What should a body paragraph contain?

Body Paragraphs - begin each with topic sentence that supports basic premise (controlling idea)
- support points with good examples and detail

What is the purpose of introduction?
What does it reveal?

Introduction - 1st paragraph - states basic premise
Reveals: - topic of essay
- opinion about topic
- organization pattern you'll use

How do you conclude?

Conclusion - should leave reader with a feeling of completion
Either: summarize basic premise or main points
- state your opinion

What are the two main facets of revising?

Revising

Strengthen support - data, examples, etc.
Edit for transitions, spelling, and grammar errors.

FIGURE 14.2 A Standard Summary Sheet

Devise advanced summary sheets. Although making up summary sheets of any kind gives you a chance to review your notes, devising advanced summary sheets also enables you to reflect on the information you have learned thus far. Reflection involves thinking about and applying the facts and ideas that you've learned. By rearranging your notes into categories that you've chosen yourself, you are doing just that.

Remember that "creativity comes only with reflection" (see Chapter 8). That's because reflection leads to *advantageous learning*—learning propelled by a burning desire to know something. What distinguishes advantageous learning from regular learning and advanced summary sheets from ordinary summary sheets is your mental attitude. You can't help being curious about your notes when you reorganize them for your summary sheets. The knowledge you gain from doing so not only provides excellent preparation for an exam but also remains with you long after the test is over.

Figure 14.3 shows an advanced summary sheet that represents more than ten pages of notes taken during two lectures. Notice how the points are categorized by century and are placed side by side for ease of comparison. The questions in the margin are appropriately brief; they hint at, but do not supply, each comparison.

Figure 14.4 shows an advanced summary sheet derived from textbook markings. The subcategories "Advantages" and "Disadvantages" were supplied by the student who took the notes. The material in each subcategory was originally scattered throughout the chapter.

Cram Systematically

Academic preparation usually eliminates the need for cramming. But if you find yourself unprepared for an exam, then cramming is an unfortunate necessity. To cram systematically, limit the information that you attempt to commit to memory, and devote the bulk of your time to reciting what you've chosen to remember instead of trying to learn even more.

Limit What You Try to Learn If your only chance to pass a course is to cram, then the one word to remember is *selectivity*. You must avoid falling into the trap of trying to learn too much. It will be extremely difficult to resist picking up important-looking bits of information along the way, but that is what you must do. Concentrate on essential facts, and use as much of your time as possible for remembering them.

Each textbook chapter has to be skimmed and searched, and the main ideas and pertinent supporting materials must be ferreted out and written

	Sociology 103--Dr. Lund	
	<u>19th CENTURY</u>	<u>20th CENTURY</u>
How is family governed?	1. Patriarchal, Father head of family.	1. Now, individualistic & democratic
Difference in stability?	2. Family stable	2. Family less stable
Status of extended family?	3. Many children and relatives under one roof--extended family	3. Smaller in size. Only two generations (parents & children)
Changes in mobility?	4. Non-mobile. Rarely moved "Old family homestead"	4. Mobility increased & residences changed often
Relationship between women & work?	5. Women: housework and children	5. Women: work outside & care for children after hours.
Attitude toward sex?	6. Puritanical on sex	6. Increasingly liberal
Variance in family types?	7. Family types in community alike	7. Greater variability in family type
Family's function?	8. Family had many functions: political, religious, economic	8. Now: function -- procreation and socialization

FIGURE 14.3 An Advanced Summary Sheet for Classroom Lecture Notes: Cornell System

in your own words on summary sheets ruled in the Cornell format. The same must be done with your lecture notes.

Recite Instead of Reread Once you've extracted the most important ideas from both your textbook and lecture notes, push aside the books and notebooks. Resist the temptation to read even more in search of important information you may have missed. It's time to admit that it's too late to try learning everything. Limit yourself to only ten or so sheets of notes from your textbook and ten sheets of notes from your classroom notes. Your hope of passing the upcoming test lies not in force-feeding yourself more and more information at the last minute but in mastering the few facts you have in front of you.

<p>I. Single Adv: 1. freehand 2. profits-his Disadv: 1. liable 2. "venture capital"</p> <p>II. Partner- Adv: 1. common pool 2. "vertical integration" 3. "horizontal integration" Disadv: 1. death & change 2. liable</p> <p>III. Corporation Adv: 1. legally formed 2. stock-capital 3. limited liability 4. perpetual-board Adv. to society: 1. production-eff. 2. continuation 3. creates capital 4. pays taxes</p>	<p>Economics 102 – Professor Maxwell</p> <p>I. Single proprietorship <u>ADVANTAGES</u> 1. Can do what desires 2. All profit goes to owner <u>DISADVANTAGES</u> 1. All losses hurt owner (unlimited liability) 2. Commerical banks ordinarily will not provide "venture capital"</p> <p>II. Partnership <u>ADVANTAGES</u> 1. Pool wealth, profits, losses 2. "Vertical integration" = gain control of resources, become own wholesaler 3. "Horizontal integration" = buy out competitors; add products; improve products <u>DISADVANTAGES</u> 1. Each time a member dies or leaves, a new partnership needs to be formed 2. Unlimited liability, even if own a small share</p> <p>III. Corporation <u>ADVANTAGES</u> 1. Easy to form (legal permission needed) 2. Issue stock to raise capital; banker underwrites stock issue and sells to public 3. Limited liability – Corp., distinct from its owners; can sue and be sued 4. "Perpetual succession," or existence. Board of directors <u>ADVANTAGES TO SOCIETY</u> 1. Technical efficiency – production of goods & services 2. Pool business risks – continuation of production 3. Creates further capital for expansion or finance new 4. It is taxed</p>
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FIGURE 14.4 An Advanced Summary Sheet from a Textbook Chapter

Now recite, recite, and recite. The notes you have selected will do you no good unless you embed them in your mind so that you can mentally carry them into the examination room. To make these notes your own, read each fact you've chosen and devise a question you can jot down in the margin of your summary sheet for which that fact is the answer. Formulating these questions will act as written recitation. Then, once you have a question for every idea, cover up the answers and test yourself by reading each question and reciting the answer from memory, again and again until you know the information cold.

By judiciously selecting the very top ideas and by using your own set of questions to help yourself memorize them, you will have a chance of passing the exam. You may not remember much once the test is over, but for now the objective is to survive the battle so that you can come back next term and continue the war.

Next time, through organized note taking, regular recitation, and systematic review, you can avoid the pressure and anxiety of cramming. A few days spent with your summary sheets will organize vast amounts of material in your mind—far more than you could ever learn by cramming. Moreover, you will be rested, confident, and ready for exams.

PREPARING YOURSELF MENTALLY

When it comes to getting ready for an upcoming exam, there's no substitute for academic preparation. But even if you know your material inside and out, there's still an advantage to be gained from putting yourself in the proper mindset as well. Some students who experience test anxiety claim that even when they've studied hard, they freeze when the test is placed in front of them. Although academic preparation is essential, a little mental preparation can help take the sting out of an exam. If you take time to find out all you can about the exam, get yourself acquainted with the test site or a similar site, and work at maintaining a positive attitude, you're more likely to escape the test-taking anxiety that plagues unprepared students.

Find Out About the Exam

Fear of the unknown can be a great contributor to test anxiety. If you walk into a test without knowing what to expect, you are likely to feel anxious.

Except in those rare cases when the instructor provides you with a copy of the test in advance, you can't be expected to know exactly what the

exam will contain. Does this mean that anxiety is inevitable? Not at all. By asking the instructor directly and by looking at previous exams, you should be able to “guesstimate” what might be on the exam and in the process dispel some unnecessary anxiety.

Ask the Instructor Directly Many students overlook the most obvious method for finding out about the contents of an upcoming exam: asking the instructor directly. In many cases, instructors are not at all hesitant to discuss what the test will involve. Ask your instructor about the types of questions (objective, essay, or both) that will be asked. Find out whether your instructor will allow partial credit, how long the exam will take, and whether textbooks, notes, calculators, or other equipment will be allowed in the exam room. When you do finally sit down to take the exam, you’re less apt to be knocked off balance by any surprises.

Use Past Exams Instructors frequently take the same approach to their exams semester after semester. Therefore, a look at an old exam can often tell you something helpful about the exam you’re studying for. Try to get a copy of last semester’s exam to see what kinds of questions were asked and to make sure you know the meanings of the words used in the directions. Use all this information to direct your study effort and to make sure you have the background you need to take the exam.

Get Acquainted with the Test Site

Exams may be held in auditoriums, large lecture halls, or ordinary classrooms. To be mentally prepared for an exam, get acquainted with the site where the test will take place or with a similar location. A week or two before the exam, study for a few hours each evening at the site where you will be taking the test. Your familiarity with the room and the sense of control you feel while studying will help establish a link between working in this room and actually succeeding on the exam. If you can’t study at the site of the test, you can still prepare yourself for the atmosphere of the test.

Study in quiet. Some students who become anxious during a test are unnerved by the silence that is a normal part of an exam. If you take some time to study in silence, the quiet of the exam should be less disconcerting.

Practice at a chairdesk. If you can’t study at the actual test site, find an empty classroom that has a similar seating arrangement, and make an effort to adjust to the feel of these slightly uncomfortable accommodations.

Use a time limit. So that you are not waiting until the last minute to discover how well you perform under a deadline, spend some of your study time working under artificial time limits not only to get a sense of how efficiently you work but also to grow accustomed to the inevitable pressure of time.

Maintain a Positive Attitude

One of the fundamental ways of preparing yourself mentally for any sort of challenge is by cultivating a positive attitude. Test-anxious students often sabotage their own efforts by mentally preparing themselves for failure. It's better to begin with a positive attitude: Relax, use self-talk, and visualize success to create such an attitude.

Learn to Relax Relaxation doesn't necessarily mean taking it easy or being lazy. It means being calm enough to work efficiently. If you're an accomplished runner, you know the best races start and end with a feeling of relaxation. To improve your chances of succeeding on a test, it's a good idea to prepare yourself by relaxing. Three simple but highly effective ways of relaxing are deep breathing, progressive muscle relaxation, and visualization.

Practice deep breathing. When we are anxious, we take rapid, shallow breaths from the chest. But shallow breathing can actually lead to anxiety. Countless experiments have confirmed this connection. When psychologist Dr. James Loehr¹ asked several subjects to breathe rapidly, shallowly, and irregularly for two minutes—in other words, to pant—he noticed a remarkable change in the emotional state of each subject. All found themselves feeling worried, panicked, and threatened even though nothing but their breathing patterns had changed.

Luckily, the reverse holds true as well. Deep breathing has been shown to produce a feeling of relaxation. A series of deep, slow breaths can often have a calming effect, even in the normally tense atmosphere before (or during) an exam.

If you feel tense before or during the exam, one way to cope with that feeling and to encourage relaxation is by “belly breathing”—that is, inhaling deeply beginning in the abdomen, instead of up in the chest. Here's how to do belly breathing:

¹James E. Loehr and Peter J. McLaughlin, with Ed Quillen, *Mentally Tough* (New York: M. Evans and Company, 1986), pp. 141–142.

1. Push out your stomach. That creates a pocket where the air can go.
2. With your stomach slightly puffed out, inhale slowly through your nose—one, two—filling up your abdomen with air.
3. Continue inhaling—three, four—this time sending air up into your lungs.
4. Exhale through your mouth, and reverse the process, counting—one, two—as you empty the air from your chest and then—three, four, five, six, seven, eight—as the air leaves your abdomen and your stomach deflates.
5. Repeat steps 1–4 three or four times until you're feeling relaxed.

Practice progressive muscle relaxation. A technique developed in the 1930s by Dr. Edmund Jacobson, progressive muscle relaxation works by diverting your attention from your mind to your body and by slowly tensing and relaxing each of your major muscle groups. This combination defuses anxiety and relaxes the muscles, which almost without exception results in a relaxed mind as well, leaving you better prepared for tackling test problems and for recalling information from your notes.

To use progressive relaxation, deliberately tense each individual muscle group, hold that tension for five seconds, and then release it. As soon as you do, reward yourself with a deep relaxing breath. Progress systematically, beginning with your toes and moving up through your body. By the time you have tensed and released all the muscles in your face, you should be feeling more relaxed and at ease throughout your entire body.

Use visualization. All of us have fond memories of places where we have felt completely relaxed. Often you can evoke a feeling of relaxation no matter where you are by imagining in detail your favorite relaxing place. If it's the seashore, for example, think not only of the sight of the slowly rolling waves but also of the sound of the surf, the smell of the salt air, the sensation of the sun on your back, and the feeling of the sand between your toes. The more vivid the image you create is, the more your body will respond as it does when you are actually there—by relaxing.

Use Self-Talk As we learned in Chapter 3, the idea of positive thinking is not just a starry-eyed slogan. You have an inner voice that is constantly chatting with you, either badgering you with negative thoughts or encouraging you with positive ones.

It helps to prepare yourself for an upcoming exam by listening carefully to what your inner voice is saying. If the message is self-destructive, now is the time to rewrite the script.

Psychologist S. C. Kobasa says that when you are facing a stressful situation, you can prevent overreaction and aggravation simply by *believing that you are in control and that you can find a solution to any problem or crisis*.² This means that if your inner voice is preaching doom and gloom, talk back to it, not necessarily out loud, but in your mind. Here are some examples of negative versus positive self-talk.

Negative—Don't Think This:

Three exams in two days is more than I can handle.

This time there's no escape.

I can't do these math problems.

I don't know how to start this research paper. I never could write.

I can't make heads or tails out of this chapter. I'll just forget it.

Positive—Think This:

I've survived worse things than this. I'll just do the best I can.

I'll just hang in there. There's always a way out.

I'll work them as far as I can and then see the TA first thing in the morning.

I'll make a list of ten titles or topics and then see the instructor in the morning for ideas.

I'll go as far as I can, identify what it is I don't understand, and then see the TA or instructor immediately.

If you can change the tone of your self-talk to make it more encouraging, you can go into the test with a constructive, rather than a destructive, attitude.

Visualize Success A number of studies have shown that visualizing an action produces many of the same responses that taking the action does. For example, if you visualize yourself eating a lemon, your body will often respond by salivating the same way it would if you were actually tasting the fruit. Similarly, if you visualize yourself taking an exam and succeeding at it, when the time comes to take the test you will have already charted a course for success. Of course, taking an exam is tougher than tasting a lemon; there's no guarantee that you will automatically succeed. But by visualizing your test-taking experience in advance, you have a much greater chance of bringing it about.

²S. C. Kobasa, "Stressful Life Events, Personality, and Health: An Inquiry into Hardiness," *Journal of Personality and Social Psychology* 37 (1979): 1–11.

SUMMARY

How can you manage, and maybe even prevent, test anxiety?

both academically & mentally
The way to manage test anxiety is by preparing yourself both academically and mentally for any quiz or exam.

How can you prepare yourself academically for a test?

Start your test preparations early, keep up with your coursework, organize yourself, and if you have to cram, do so systematically.

What does starting early involve?

*few days before
read syllabus
ask for help*

Effective test preparation begins a few days before the first class. If you buy your textbooks as soon as you're registered for a course, read your syllabus, and ask for help at the very first sign of academic trouble, you will build a strong foundation for learning thoroughly and being able to perform well.

How does keeping up with coursework prepare you for taking a test?

Take Notes

It's not enough to actively read your assignments and carefully listen to lectures. You must take notes and thoroughly master them to retain the information you get from lectures and readings.

What is meant by "organize yourself"?

*using your primary
sources
schedules
notes: compressing
categorizing
summary sheets*

Getting organized means using your primary resources—your time and your notes—as efficiently as possible. The best way of organizing your time is by using time schedules (the homestretch schedule and the exam-week schedule) geared toward the upcoming exam. The best way of organizing your notes is by compressing and categorizing them into a handful of summary sheets, both regular and advanced.

Is there such thing as systematic cramming?

*YES
avoid memory overload
spend most time reciting
limited*

Yes. You can cram systematically by limiting what you try to learn, thus avoiding memory overload, and by spending most of your time reciting the limited information you've selected.

How can you mentally prepare for an exam?

*maintain a positive
attitude*

If you find out all you can in advance about the upcoming exam, get used to the test-taking site, and make a conscientious

How do you find out what an exam will be like?

Ask directly exactly what will be on test, look at past exams

What is meant by "getting acquainted with the test site"?

study sometimes @ actual test site

How do you maintain a positive attitude about a test?

Think it a challenge use self-talk visualize success

effort to maintain a positive attitude throughout, you should be able to minimize—even eliminate—test anxiety.

You can get a pretty good idea of what the exam will contain by asking the instructor directly about the kind of exam he or she has prepared and by looking at past exams.

This phrase means that if your usual study area differs sharply from the location where you'll be taking your test, it helps to spend some time studying at the actual test site or at a place that approximates it.

Think of a test as a challenge instead of a threat. You can boost your attitude by learning to relax, by using self-talk, and by visualizing success.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Test grades, like the financial bottom line, are an indication of _____.
interest success anxiety
2. Experiments have shown that people do not react logically in a _____.
test library crisis
3. It is a good idea to answer the easiest test questions _____.
first last carefully

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|----------------------|---|
| _____ 1. Reflection | a. Recommended cure for test anxiety |
| _____ 2. Cramming | b. Key to mastering your notes |
| _____ 3. Attitude | c. Should be done sensibly and methodically |
| _____ 4. Selectivity | d. Helps put a course in proper context |

- | | |
|----------------------|--|
| _____ 5. Recitation | e. Necessary to turn note sheets into summary sheets |
| _____ 6. Preparation | f. Bonus derived from advanced summary sheets |
| _____ 7. Syllabus | g. Can be improved through relaxation, self-talk, and visualization of success |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. The Silver Dollar System can be used to condense your notes into summary sheets.
- _____ 2. A regular summary sheet looks just like a Cornell note sheet.
- _____ 3. Advanced summary sheets promote advantageous learning.
- _____ 4. You should be able to predict exactly the sort of questions a test will include.
- _____ 5. Visualizing an activity can produce many of the same responses as occur when you perform that activity.
- _____ 6. Awareness of an inner voice is one more distraction that is best ignored.
- _____ 7. Relaxation provides the foundation for most techniques of mental preparation.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

- 1. Advance preparation for a test or exam can be compared to a(n)
 - a. air raid.
 - b. fire drill.
 - c. road race.
 - d. earthquake.
- 2. Deep breathing has been shown to produce feelings of
 - a. anxiety.
 - b. fatigue.
 - c. relaxation.
 - d. resentment.

3. The block of time right before an exam should be reserved for
 - a. one last review session.
 - b. a few moments of relaxation.
 - c. a nutritious meal.
 - d. rereading a troublesome chapter.
4. Traditional reciting works best when it is done
 - a. out loud.
 - b. in your own words.
 - c. from memory.
 - d. in all the above ways.
5. Becoming acquainted with a test site means
 - a. walking through the room.
 - b. spending time there practicing for the test.
 - c. learning the exact time and location of the test.
 - d. none of the above.
6. You can simulate the test site by
 - a. working in a quiet environment.
 - b. studying at a chairdesk.
 - c. using a time limit.
 - d. doing all the above.

Short answer. Supply a brief answer for each of the following items.

1. What is a homestretch schedule?
2. How should meals, sleep, and exercise be affected by exam preparation?
3. What are summary sheets?
4. What is the difference between a regular and an advanced summary sheet?
5. What is the connection between progressive muscle relaxation and exam preparation?

THE WORD HISTORY SYSTEM

curfew cur'-few *n.* A regulation requiring certain or all people to leave the streets or be at home at a prescribed hour.

Curfew: *cover the fire for the night*



In the Middle Ages, peasants were required to cover or to extinguish their fires at a fixed hour in the evening announced by the ringing of a bell called the “cover-fire,” French *couvre-feu*. The Norman French used the word in England, where it was adopted as *curfu*, modern *curfew*, meaning the hour and the signal for citizens to retire to their homes, or, as now, for the closing of a public place or the cessation of an activity for the night.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

No one wants advice—only *corroboration*.

—John Steinbeck (1902–1968), American novelist

1. only *corroboration* cooperation agreement confirmation

Incomprehensible jargon is the *hallmark* of a profession.

—Kingman Brewster, Jr. (1919–1988), president of Yale University and U.S. ambassador to Britain

- | | | | |
|----------------------------|--------------|----------------|----------|
| 2. <i>incomprehensible</i> | self-evident | unfathomable | foreign |
| 3. <i>jargon</i> | lingo | shorthand | writing |
| 4. the <i>hallmark</i> | direction | identification | standard |

If you do good, people will accuse you of selfish *ulterior motives*. Do good anyway.

—Dr. Robert Schuller (1926–), American evangelist

- | | | | |
|--------------------|------------|---------|--------------|
| 5. <i>ulterior</i> | monetary | hidden | self-serving |
| 6. <i>motives</i> | advantages | profits | reasons |

A team should be an *extension* of the coach's personality. My teams were *arrogant* and *obnoxious*.

—Al McGuire (1928–), American basketball coach

- | | | | |
|---------------------|--------------|-------------|---------------|
| 7. <i>extension</i> | mirror-image | counterpart | continuation |
| 8. <i>arrogant</i> | haughty | excitable | high-spirited |
| 9. <i>obnoxious</i> | tough | noisy | nasty |

MASTERING OBJECTIVE TESTS

What is the answer? . . . In that case, what is the question?

—GERTRUDE STEIN, AMERICAN WRITER; REPORTEDLY HER
LAST WORDS

The real purpose of objective tests is to test your knowledge, not try your patience. Yet when faced with the prospect of answering true-false, multiple-choice, matching, or sentence-completion questions, many students would prefer to choose “none of the above.” What they may not realize is that becoming an objective test expert is one of the easiest tasks to master. To show you how, this chapter looks at:

- Understanding the kinds of objective questions
- Choosing effective study methods
- Moving systematically through the test
- Learning strategies for specific question types

MASTERING OBJECTIVE TESTS

Understanding the Kinds of Objective Questions

True-False Questions

Multiple-Choice Questions

Matching Questions

Sentence-Completion Questions

Choosing Effective Study Methods

Use the Questions-in-the-Margin System

Become a Study "Switch Hitter"

Moving Systematically Through the Test

Read the Directions First

Read Questions Carefully

Mark Only the "Sure Things" at First

Guess the Third Time Around

Learning Strategies for Specific Question Types

True-False Questions

Multiple-Choice Questions

Matching Questions

Sentence-Completion Questions

Most of the test questions you'll be expected to answer in college fall into one of two categories: essay questions and objective questions. Essay questions take a broader view of a subject and generally place an emphasis on your ability to recall and organize what you've learned and write about it. Objective questions focus more on details and on your ability to recognize, rather than recall, them. Mastering an objective test means understanding the kinds of questions that such a test will contain, choosing an effective study method for committing material to memory, moving systematically through the test itself, and learning strategies for specific question types.

UNDERSTANDING THE KINDS OF OBJECTIVE QUESTIONS

Although they're all basically related, true-false, multiple-choice, matching, and sentence-completion questions each have qualities and quirks of their own. Awareness of these can make you a better and more confident test taker.

True-False Questions

The basic idea behind a true-false question is simple: It consists of a single statement; your job is to decide whether it's true. What makes the choice more difficult is that to be true, this statement must be 100 percent true, not 50 percent or even 99 percent. One word is all it takes to turn a true statement into a false one. Consider, for example, the impact of a word like *always* on a true-false statement or how words like *no* or *not* radically change a statement's meaning. You have to be especially careful about reading each statement thoroughly before you answer it. Look at the following example:

T F In 1787, the year the United States ratified the Constitution, Washington, D.C., became our nation's capital.

The answer to the preceding statement is false. Although it is true that the Constitution was ratified in 1787 and that the nation's capital is Washington, D.C., the United States had no federal capital until 1790, when Congress chose Philadelphia. It wasn't until ten years later, June 10, 1800, that Washington officially became the capital.

Multiple-Choice Questions

A multiple-choice question normally begins with an incomplete sentence known as a *stem* and is followed by a series of choices, known as *options*, for completing that sentence. In most cases, your job is to find the option that best completes the stem. Here is an example:

- Stem \longrightarrow In 1787, the year the United States ratified the Constitution,
- Options $\begin{matrix} \nearrow \\ \longrightarrow \\ \searrow \end{matrix}$
 - a. George Washington became the country's first president.
 - b. Washington, D.C., became the nation's capital.
 - c. New Mexico was admitted to the union.
 - d. the country had no official capital.

In this question, connecting option (d) to the stem results in a true statement. Linking the stem to any other option results in a false statement.

Answering multiple-choice questions entails problems you won't encounter when you're taking a true-false test:

Varying directions. Some multiple-choice directions tell you to pick more than one correct option; others ask you to mark the one option that is incorrect. Be sure to read the directions carefully and go over all the options before you mark your selection.

Divided context. Because each choice in a multiple-choice question is usually divided into stem and option, you have to mentally connect the two components to determine whether an option is correct. Correct answers aren't always obvious, even when you know your material.

Differing format. Most multiple-choice questions follow the incomplete stem and option format. In some cases, however, the stem may be made up of an entire sentence. A setup of this sort can take you by surprise if you're expecting a standard multiple-choice question, but in general this variation is easier because you don't have to work with a divided context.

Matching Questions

Items in a matching test are usually divided into two columns and arranged in random order. Using a relationship that is normally explained in the directions, you systematically match the items in one column with the items in the other. (Consider test shown on the following page.)

Matching tests work like multiple-choice questions with an added dimension. You're faced with a *multiple* multiple choice. Instead of one stem and several options, you have several stems and several options.

Directions: Match the inventions in the right-hand column with the inventors in the left-hand column by writing the proper letter in the space provided alongside each inventor's name. Use each item in the right-hand column only once.

Inventor	Invention
_____ 1. Eli Whitney	a. Automobile assembly line
_____ 2. James Watt	b. Telephone
_____ 3. Robert Fulton	c. Vulcanizing of rubber
_____ 4. Cyrus McCormick	d. Six-shooter revolver
_____ 5. Elias Howe	e. Steel plow
_____ 6. Henry Ford	f. Steamboat
_____ 7. James Hargreaves	g. Motion pictures
_____ 8. Richard Arkwright	h. Cotton gin
_____ 9. Samuel Colt	i. Dynamite
_____ 10. Charles Goodyear	j. Steam engine
_____ 11. Alfred Nobel	k. Telegraph
_____ 12. Thomas Edison	l. Sewing machine
_____ 13. Guglielmo Marconi	m. Spinning frame (textiles)
_____ 14. John Deere	n. Radio
_____ 15. Samuel Morse	o. Spinning jenny
_____ 16. Alexander Bell	p. Grain-reaping machine

Answers: 1. h 2. j 3. f 4. p 5. l 6. a 7. o 8. m 9. d 10. c 11. i 12. g
13. n 14. e 15. k 16. b

This extra dimension adds extra complications as well. Matching carelessly or guessing prematurely can sometimes lead to a chain reaction of mistakes. If you make an incorrect match, you will deprive another item of its rightful match. This can aggravate your error by increasing the chances of another bad connection, which in turn can lead to another wrong match. Avoid this potential pitfall by making your matches carefully and by pairing up the items you are sure of before you begin guessing on items you're uncertain about.

Sentence-Completion Questions

A typical sentence-completion question consists of a partial sentence and one or more blanks. Your job in answering these kinds of questions is to read the sentences and determine what words belong in the blanks.

Sentence-completion questions work like multiple-choice questions without the choice. Unlike multiple-choice questions, sentence-completion questions can't actually be considered objective, but because the sentence is incomplete and because the answer is seldom vague or ambiguous, most sentence-completion questions can be answered following the same basic procedure you use for answering bona fide objective questions. For example:

Sentence-completion questions work like multiple-choice questions without the _____.

CHOOSING EFFECTIVE STUDY METHODS

As we've already discovered, your success on a test is directly related to how effectively you've studied for that test. You must master your material as efficiently as possible but in a way that will prepare you for any type of test question.

Use the Questions-in-the-Margin System

The safest way of preparing yourself for an objective test is the safest way of preparing yourself for any kind of test—by studying to the point of recall. Although objective exams and quizzes generally test your ability to recognize, rather than recall, information, learning your notes to the point of recall gives you far greater control over what you've learned. You can tackle a question with confidence when you arrive at the answer independently of the cues that the rest of the question offers.

For that reason, the best way of studying for an objective test is by mastering your notes with the Questions-in-the-Margin System. This system (explained in Chapter 11) provides your notes with a built-in system for mastery: As you read each cue in the margin, you are compelled to recall the information to which it refers.

Another advantage that the Questions-in-the-Margin System provides has to do with the form that the marginal cues take: They're questions! You'd be hard pressed to find a more logical way of preparing for a test filled with questions than by mastering your notes using questions as cues.

Become a Study "Switch Hitter"

Baseball players who bat from both sides of home plate are more flexible than those who can hit only right-handed or left-handed. In the same way,

you can often improve your test-taking average when you master the material in your notes from both directions instead of from just one. Use the Questions-in-the-Margin System as you normally would to recall each important idea, but from time to time reverse the process by covering your questions, reading your notes, and then seeing whether you can remember the questions you wrote to accompany each important idea.

If you have time and want to make absolutely certain you know your material, write down each important idea from your notes on the front of a separate 3×5 card, and then jot down your cue on the back. A stack of cards, instead of a few sheets of paper, enables you to constantly rearrange your notes, ensuring that you will be able to recall important information, regardless of the order in which it's presented.

MOVING SYSTEMATICALLY THROUGH THE TEST

Good students, those who understand what different objective questions require and have employed the most effective study methods, may still run into trouble unless they apply the same reasoned, organized approach they used in preparation to the process of taking the test. The only way to put what you know to good use is to move through the test systematically by reading the directions before anything else, by reading each question carefully, by initially marking only the "sure things," and by guessing only after you've made two sincere attempts to arrive at the answers logically. If you approach the test in this orderly fashion, you have an excellent chance of making the most of what you've learned.

Read the Directions First

It takes just a minute or two to read a test's directions, and yet the little time that you invest in doing this can often make a drastic difference in your score. Carelessness may do as much to torpedo a test as genuine ignorance does. If the directions for a multiple-choice test say, "Mark the two best answers," but you pass over the directions and mark only one option in each case, then most of your efforts will have been in vain.

Read Questions Carefully

Objective questions, no matter the type, are usually filled with information. Each word in the question is likely to be far more important than a word in

an ordinary sentence. For that reason, you must read each question carefully and thoroughly to pick up important details and the complete context.

Cope with Qualifiers The English language has more than a dozen common qualifiers—including *always*, *most*, *equal*, *good*, and *bad*—words that we use regularly in writing and conversation and that test makers often deliberately insert into objective test questions, especially true-false and multiple-choice questions.

Qualifiers do precisely what their name implies: They complicate a simple statement or option by adding a qualification. The following two statements

It *often* rains in Seattle, Washington.

It *always* rains in Seattle, Washington.

are nearly identical. Yet one of them (the first one) is true, while the other (the second one) is false. In this case, the only thing that differentiates the two statements is their qualifiers: *often* and *always*. If you read through these statements too quickly, you may overlook their qualifiers.

Now look at a multiple-choice example:

The head of a kettledrum is

- a. struck only with wooden mallets.
- b. always made of sheepskin.
- c. often made of calfskin.
- d. tightened once a day.

In this example, option (d) is just plain incorrect. Qualifiers indicate which of the three remaining options is correct. Without the qualifiers, all three options would be correct: Kettledrum heads *are* struck with wooden mallets, they *are* made of sheepskin, and they *are* made of calfskin. But because the qualifiers *only* and *always* overstate the case, options (a) and (b) are incorrect; while *often*, the qualifier in option (c), takes a more moderate stance and is therefore correct.

The qualifiers *only* and *always* in the first two options are both good examples of 100 percent words. These qualifiers imply that the statements they appear in are true 100 percent of the time. Such qualifiers almost always make a statement false; very few things in this world are 100 percent one way or the other. Although it is wise to watch out for these words, don't automatically consider a statement wrong because it contains one of them. To keep you honest and alert, some instructors occasionally use 100 percent words in true statements:

All stars are surrounded by space.
All human beings need food to survive.
No human being can live without air.

A simple and effective strategy for coping with qualifiers is to keep careful track of them by circling each one that appears in a test question. Circling the qualifiers helps ensure that you don't ignore them. Then you can mentally substitute other words that will change the meaning of the question. This method is sometimes referred to as the *Goldilocks Technique* because you try out several qualifiers until you find the one that's "just right." Most qualifiers are clustered in groups, or "families." If you can find another family member that does a better job of completing the sentence, then the original question is probably false or, in the case of multiple choice, is probably an incorrect option. The qualifiers in the families that follow may overstate a true-false statement, understate it, or make it just right. Memorize the six families. They will help you answer true-false questions and make the right choice among multiple-choice options.

All—most—some—none (no)
 Always—usually—sometimes—never
 Great—much—little—no
 More—equal—less
 Good—bad
 Is—is not

Whenever one qualifier from a set is used in a true-false statement or a multiple-choice option, substitute each of the others for it in turn. In this way, determine which of the qualifiers from the family fits best (makes the statement just right). If that is the given qualifier, the answer is true; otherwise, the answer is false.

For example, suppose you are given this question:

T F All birds can fly.

Substituting the other qualifiers in the *all* family gives you these four statements:

<i>Original Statement</i>	<i>Related Statements</i>
All birds can fly.	Most birds can fly.
	Some birds can fly.
	No birds can fly.

The statement that begins with *most* is just right, but that is not the statement you were originally given. Therefore, the original answer is false.

Notice Negatives Negatives can be either words such as *no*, *not*, *none*, and *never* or prefixes such as *il-*, as in *illogical*; *un-*, as in *uninterested*; and *im-*, as in *impatient*. Negatives are common in everyday speech and writing and almost as common in objective tests.

Negatives cause problems in objective questions because, like qualifiers, they can easily be overlooked, particularly negative prefixes that have a way of blending in with the words they modify. For example:

Because it is liquid at room temperature, mercury is indistinguishable from other metals.

If you read this sentence quickly, you may miss the two letters *i-n* and mark the statement true as a result. But if you read the statement carefully, you will realize that just the opposite is true.

Objective questions that contain two or more negatives can be even more troublesome. For example, you would probably be able to mark this statement “true” without much difficulty:

It is logical to assume that Thomas Edison’s fame was due to his many practical inventions.

Yet you might have trouble with the sentence

It is illogical to assume that Thomas Edison’s fame was not due to his many practical inventions.

even though it is also true.

When you find negatives in objective questions, circle them. Then disregard them for a moment and try to gain the meaning of the question that remains. Finally, reread the sentence with the negatives included. Each negative you add reverses the meaning of the question. With two negatives, for example, the question’s meaning should be the same as it was without.

Use Grammatical Clues Although formats vary, all questions follow the rules of grammar. This fact can help you narrow your choices by eliminating those possible answers that don’t produce grammatically correct sentences. The only way to determine whether the rules of grammar are being followed or broken is by reading the entire question so you are able to get its total context. Consider this question:

The people of Iceland

- a. a country located just outside the Arctic Circle.
- b. are the world’s most avid readers.
- c. claim to be descendants of the Aztecs.

d. the capital, Reykjavik, where arms talks have been held.

If you race through this example, you might be tempted to mark either (a) or (d) as the correct response. Indeed, Iceland is a country located just outside the Arctic Circle, and Reykjavik, the capital, has been the site of important arms negotiations. But if you take the time to read the entire question, you can see that these two responses do not complete the stem grammatically. (Response [a] is missing the predicate of the sentence, and response [d] is missing any grammatical connection to “The people of Iceland.”) That leaves (b) and (c) as the only legitimate options. (The correct answer is [b].)

Grammatical clues are even more helpful in sentence-completion questions, where your response must be recalled instead of chosen from a list of possible answers. For example:

Although about 75 million meteors enter our atmosphere each day, on the average only ____ of them ever reaches the ground.

Because *reaches* is a singular verb form, the only correct answer is *one*. (Otherwise the question would have read *reach*, the plural form.)

Choose the Best Response Some objective questions supply more than one *good* response, but in most cases there is only one *best* response. It’s difficult to tell a good response from a best response unless you have read through the question completely. If you grow impatient and mark down the first answer that sounds right, you risk missing the best answer.

Here’s a multiple-choice example:

You would expect to find an aglet

- a. on your foot.
- b. in a nest.
- c. in a small farming community.
- d. at the tip of a shoelace.

An aglet is the cap, often made of plastic, at the end of a shoelace. If you read only partway through this question, you might be tempted to pick option (a). That’s a good choice, but if you read the whole way through the question, you can easily see that it’s not the best choice. Only with the question’s entire context can you tell which option is a good answer and which is even better. (The best option is [d].)

Mark Only the “Sure Things” at First

If a question has you stumped at first, don’t feel compelled to answer it right away. And don’t pick a “temporary answer” with the thought that you

can come back and change it later. You may not have time, and even if you do, you may not be able to distinguish your uncertain answers from your certain ones.

On your initial pass through the test, mark only those answers you are sure of. (This is especially crucial in matching questions, where one mistake can set off a chain reaction of incorrect answers.) If an answer doesn't come to mind right away, circle any qualifiers or negatives, eliminate any choices you know are incorrect, and then move on to the next questions. These markings will provide you with a head start on your second pass.

Guess the Third Time Around

Except when there's an extra penalty for incorrect answers, guessing is always better than simply leaving a question blank. A question unanswered guarantees a zero, whereas a guess may score some points. Furthermore, if you know something about the material and have given it some genuine thought, then you should be able to make an intelligent guess. Intelligent guesses are always superior to random ones. Consider this particular sentence-completion item:

You can travel by ship from New England to Florida without ever entering the usually rough open seas by using a system of rivers and canals called the _____.

If you don't know the official name for the system, this sentence is long enough and descriptive enough to help you come up with a good guess. You might call it the "Inland Waterway." That's not the exact name, but it is very close, and you would likely receive partial credit for it. (The answer is Intracoastal Waterway.)

LEARNING STRATEGIES FOR SPECIFIC QUESTION TYPES

In the strictest sense, there are no tricks for taking objective tests. The requirement for taking any test is basically the same: Know your material. To select the correct answer with any degree of certainty, you must be familiar with the type of question, you must have studied effectively, and you are wise to move systematically through the test. Once you've done this, there are some other actions you can take, depending on the question type, to improve your chances of answering correctly.

True-False Questions

Although you have a 50-50 chance of answering a single true-false statement correctly, the odds are not that high for the entire test. In fact, your chances of guessing correctly on every statement decrease geometrically with every question. In a ten-question test, the odds on guessing are against you by more than a thousand to one. If you're unsure of whether to mark "T" or "F" and you're forced to guess, adopt these two strategies to influence your decision and improve your odds.

Mark "True" If You're Stumped Because instructors would rather leave true information in your mind, they tend to stack true-false tests with more true statements than false ones. You shouldn't guess right away on a true-false question, but if you're stumped and pressed for time, the odds are in your favor if you choose true over false.

Be Suspicious of Longer Statements Remember the importance of context, and remember that true-false statements must be 100 percent true. Each word added to a true-false statement increases its chances of being false. All it takes is one incorrect word to make the statement false.

Multiple-Choice Questions

You can use several more strategies to cope with multiple-choice questions.

Pick "All the Above" If You're in Doubt Most multiple-choice questions present just a single fact, the option that correctly completes the stem. But with "all the above" the test maker can include several options instead of just one. As the purpose behind a quiz or exam is not only to test but also to teach, "all the above" becomes an attractive choice for the test maker.

Here's an example of a question that uses "all the above":

Until the first half of the second millennium B.C., an army laying siege to a city had use of

- a. scaling ladders.
- b. siege towers.
- c. archery fire.
- d. all the above.

The correct answer is (d).

One way to confirm the choice "all the above" is to pick out two correct answers in the options. For instance, in the last example given, just

suppose you are sure that ladders and towers were used, but aren't certain about archery fire. Unless the directions permit you to mark more than one option, you already have all the information you need to choose the correct answer. If option (a) is correct and option (b) is correct, then (d) is the only logical answer.

It would be a mistake to mark every "all the above" you run into before reading the question and carefully considering the options. But if you can't seem to come up with an answer and you're running out of time, then choosing "all the above" is usually a pretty safe bet.

Use the True-False Technique to Change Perspective If you know your material but have a mental block about the multiple-choice format, you can gain a new perspective on a difficult question by using the *true-false technique*. Almost any multiple-choice question can be thought of as a series of true-false statements. Simply rethink a troublesome multiple-choice question as a set of true-false statements. Here's an example:

Before becoming president in 1857, James Buchanan was

- a. married and divorced.
- b. secretary of defense.
- c. prime minister of Canada.
- d. secretary of state.

This question and its options can be thought of as four true-false statements:

- T (F) Before becoming president in 1857, James Buchanan was married and divorced.
- T (F) Before becoming president in 1857, James Buchanan was secretary of defense.
- T (F) Before becoming president in 1857, James Buchanan was prime minister of Canada.
- (T) F Before becoming president in 1857, James Buchanan was secretary of state.

Viewing the question in this way can sometimes make it easier to spot the correct answer. The true statement you find in the true-false statements you create usually contains the correct multiple-choice option.

Discard Foolish Options Some multiple-choice options are distractors. Whatever the reason for their inclusion, foolish options are almost always good news for students. Exactly what the foolish option says is irrelevant. The important point is that you can eliminate it right away and pick the correct answer from the options that remain. Look at this example:

According to British tradition, the queen of England is not permitted to enter

- a. West London.
- b. the House of Commons.
- c. the Soviet Union.
- d. the Indianapolis 500.

Option (d) is so silly that you can immediately cross it out. (The correct option is [b].)

Choose the Middle Number from a Range of Numbers Questions that use numbers as choices can be easily answered if you've memorized the correct number. But if you haven't really mastered your material or if you have a tough time with numbers in general, then this kind of question can be a nightmare.

If you have no other information to go on, you can increase your chances of guessing correctly by eliminating the highest and lowest numbers. Test writers usually include at least one number lower than the correct answer and one number higher. Using this "rule," you can eliminate half the options in a four-option question. For instance:

A water polo team has _____ players.

- a. three
- b. ten
- c. seven
- d. five

Even if you know nothing about water polo, you can use the midrange rule to eliminate two options and improve your odds from one out of four to one out of two. (The correct option in this case is [c].)

Matching Questions

Answering matching questions effectively is mainly a matter of staying organized and saving time. You have a lot of items to read over, usually in a limited amount of time. A few strategies can increase your efficiency and reduce your confusion.

Mark Off Matches to Avoid Redundancy This idea is so simple that it's often overlooked: Each time you match two items in a matching test, cross them off or mark them with a circle or an X. That way, when you move on to the next match, you'll have fewer items to read, and you won't be confused about which items you've chosen and which ones you haven't.

Match Shorter Items to Longer Ones In most matching tests, the items in one column are longer than the items in the other. For example, a typical matching test might contain a column of terms and a column of definitions. In cases like these, you can save yourself some time if you set out in search of matches for the longer items instead of the reverse. In other words, the column you keep reading and rereading contains the shorter items. That way you need to read each long item only once. It's a case of the dog wagging the tail instead of the other way around.

Sentence-Completion Questions

Because with a sentence-completion question the answer isn't there for you to choose, there are no real tricks to help you pick out the correct answer. But there are methods that enable you to clearly define the specific context of the question. When you do this, you zero in on the answer that will fill in the blank.

Clarify Ambiguity with a Specific Question Sometimes a question seems to have two or more reasonable answers. In these cases, you may need to clarify the kind of answer the question is seeking. The best strategy for coping with ambiguous questions is to raise your hand and ask a well-formulated, unambiguous question of your own to clear up the confusion. Consider this item:

In 1901, at the age of forty-two, Republican Theodore Roosevelt became the country's _____ president.

In this example, both "youngest" and "twenty-sixth" would be reasonable answers, but it's unlikely the instructor would be looking for both. If you raised your hand and said, "I don't understand this question," you would probably get a response like "Do your best." But a well-thought-out, more specific question would probably be rewarded with a more helpful response. For example, if you asked, "Are you looking for a number?" the instructor's response would enable you to decide which of your two answers is expected.

Disregard the Length of the Blank Sometimes the length of the empty line equals the length of the answer expected. But in general there's no connection between the two. Pay attention to the words that are present, rather than to those that are missing, to come up with your answer for a sentence-completion question. Don't let the blank line distract you.

Treat Some Sentences as Two Separate Questions Even students who aren't influenced by the size of one blank when answering a sentence-completion question may become flustered by a question that has two blanks. If the blanks are side by side, then the question may be calling for a person's name or a place name. Paying attention to the question's context should help you to confirm whether this is the case. But if the blanks in a sentence-completion question are widely separated instead of side by side, then a different strategy is called for.

The best way to treat two blanks in a sentence-completion question that are widely separated is as though each occurred in a separate sentence. There may or may not be a direct relationship between the missing words, so make sure that each filled-in word makes sense in its own part of the statement. Here's an example:

Although corn is second only to _____ as the most widely grown crop in the world, no one in Europe had even heard about corn until _____ returned from the New World.

In the first portion of the sentence, the word *corn* indicates you're dealing with a grain. If you had read your textbook carefully (or if you hadn't but used your common sense), you'd know the answer is wheat. The second blank demands a person's name: Columbus.

SUMMARY

What are the distinguishing features and pitfalls of the various kinds of objective questions?

True-false, multiple-choice, matching, and sentence-completion questions are all related, but each has its peculiarities. A true-false statement must be 100 percent true before you can mark it as true; a single word can make the difference. A multiple-choice question normally asks you to complete a stem with one of four or five options. Because your choices are separated from the stem, obtaining the context can be difficult. In addition, varying directions and a differing format can complicate a multiple-choice question. A matching question operates like an expanded version of a multiple-choice question: You pair up the proper items from a column of

What system helps you study more efficiently for objective tests?

How can you become a study “switch hitter”?

What are the steps in moving through a test systematically?

Why is it so important to read objective questions carefully?

Why should you mark only the “sure things” to start?

stems and a column of options. But if you mismatch a set, you can create a chain reaction of errors. A sentence-completion question asks you to use the context of an incomplete statement to determine the word or words that are missing. The role of context is crucial because you must recall the correct answer; it isn't written out for you to choose.

The most efficient way of studying for an objective test is with the Questions-in-the-Margin System. This system not only helps you learn your material to the point of recall but also enables you to gear up for answering test questions by practicing with questions of your own.

After you've been studying your material using the Questions-in-the-Margin System, you can increase your flexibility by switch hitting—that is, by reversing the process by covering your questions and using your notes to see if you can remember the questions.

First read the directions. Then read each question carefully and completely. Mark only the answers you're certain about at first. Then return to those questions that stumped you. If you still draw a blank, make an intelligent guess.

Reading questions thoroughly enables you to note all of a question's details, particularly any qualifiers and negatives, which modify or reverse the meaning of a statement or option. Complete reading also allows you to use grammatical clues and contextual clues to help pinpoint your answer and pick the best response instead of just a good one.

Marking only the answers you are certain about at first avoids the problem of not being able to distinguish later on between your certain and uncertain answers.

Should you guess on objective questions?

Except in cases where you are penalized for guessing, it usually makes sense to guess if you can't answer a question after two tries.

What strategies can you use with true-false questions?

Become aware of the types of statements that are likely to be true and those that are apt to be false. In general a true-false test contains more true statements than false ones. If you're pressed for time and have to choose, you're safer picking true than false. But view longer true-false statements with suspicion: More words in the statement mean more chances that it is false.

What strategies help you answer multiple-choice questions?

If you have to guess, pick "all the above." If you know the material but have difficulties with the multiple-choice format, try converting the question into a series of true-false statements, which you'll probably find easier to handle. Also, eliminate foolish options right away, and choose one of the middle numbers in a range of numbers if you have to guess.

What can you do to better your chances on a matching question?

If you carefully mark each item after you've used it, you won't waste time rereading answers that you have already chosen. And if you look for matches for the column that has longer items, you'll save some time because you'll need to read each long item only once.

What strategies can you use when answering sentence-completion questions?

The best strategies are to clarify an ambiguous question by asking more specific clarifying questions of your own; to disregard the length of a question's blank, which may not indicate the length or size of the answer; and to treat a two-blank question as two questions instead of one.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. Negative and absolute words should be _____.
avoided circled defined
2. In matching questions, the fewer the remaining choices, the better are your chances of being _____.
incorrect correct alert

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------------|---|
| _____ 1. Negative | a. Statement that starts off a multiple-choice question |
| _____ 2. Guessing | b. One of the choices that make up a multiple-choice question |
| _____ 3. Context | c. Mastering possible test material from both sides |
| _____ 4. Stem | d. Almost always better than leaving a question blank |
| _____ 5. "Sure thing" | e. Should be marked on first pass through the test |
| _____ 6. "Switch hitting" | f. Best choice when stumped by a true-false question |
| _____ 7. True | g. Usually reverses meaning of a true-false statement |
| _____ 8. Option | h. Provided when you read the entire question |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. For a statement to be marked true, it must be entirely true.
- _____ 2. Some multiple-choice questions ask you to pick more than one answer.
- _____ 3. The stem of a multiple-choice question is always an incomplete statement.
- _____ 4. True-false tests generally contain more true statements than false ones.

- _____ 5. Qualifiers are found only in multiple-choice questions.
- _____ 6. Each word added to a true-false statement increases its chance of being false.
- _____ 7. The length of the blank dictates the size of the answer in a sentence-completion question.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. A multiple-choice question can be viewed as a series of
 - a. stems.
 - b. qualifiers.
 - c. true-false statements.
 - d. decoys or distractors.
2. One way to think of a matching question is as
 - a. a multiple-choice question without the choice.
 - b. a true-false question in two dimensions.
 - c. a multiple multiple-choice question.
 - d. none of the above.
3. Reading the entire question should help you
 - a. detect grammatical clues.
 - b. take advantage of context.
 - c. select the best response.
 - d. do all the above.
4. If at first a question has you stumped, you should
 - a. move on to another question.
 - b. ask a clarifying question.
 - c. pick a temporary answer.
 - d. cross out any negatives or qualifiers.
5. The greatest threat of negatives is that they can be easily
 - a. replaced.
 - b. overlooked.
 - c. misunderstood.
 - d. reversed.
6. A sentence-completion question with two widely separated blanks should be treated as
 - a. a true-false question.
 - b. two questions.

- c. a decoy or distractor.
- d. an essay question.

Short answer. Supply a brief answer for each of the following items.

1. Compare and contrast the four basic types of objective questions.
2. What are some potential pitfalls of multiple-choice questions?
3. Explain the Goldilocks Technique.
4. What is the “chain reaction” associated with matching tests?
5. What is the purpose of the true-false technique?

THE WORD HISTORY SYSTEM

deliberate de-lib'-er-ate *adj.* 1. Done with or marked by full consciousness of the nature and effects; intentional. 2. Arising from or marked by careful consideration. 3. Unhurried in action, movement, or manner, as if trying to avoid error.

Deliberate: *weighed in the scales*



A *deliberate* decision is one based upon a weighing of the facts and arguments involved—and that is the literal meaning of the word. *Deliberate* is derived from Latin *deliberatus*, past participle of the verb *deliberare*, from *librare*, “to weigh.” *Librare* comes from *libra*, “a balance” or “pair of scales.”

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Nations are not ruined by one act of *violence*, but gradually and in an almost *imperceptible* manner by the *depreciation* of their circulating currency, through its *excessive* quantity.

—Nicolaus Copernicus (1473–1543), Polish astronomer

- | | | | |
|--------------------------------|-----------------|--------------------|--------------------|
| 1. act of <i>violence</i> | damaging force | enormous effect | gigantic power |
| 2. almost <i>imperceptible</i> | unknown | controlled | unseen |
| 3. the <i>depreciation</i> | stable
value | decreased
value | increased
value |
| 4. <i>excessive</i> quantity | commercial | inordinate | required |

Another advantage of being rich is that all your faults are called *eccentricities*.

—Anonymous

- | | | | |
|---------------------------------|----------|---------------|-----------|
| 5. called <i>eccentricities</i> | creative | peculiarities | inventive |
|---------------------------------|----------|---------------|-----------|

No man can be *conservative* until he has something to lose.

—James P. Warburg (1896–1969), American publicist

- | | | | |
|------------------------|-----------|----------|-----------|
| 6. <i>conservative</i> | objective | cautious | judicious |
|------------------------|-----------|----------|-----------|

When a subject becomes totally *obsolete* we make it a required course.

—Peter Drucker (1909–), American business philosopher and author

- | | | | |
|----------------------------|---------------|----------|-----------|
| 7. totally <i>obsolete</i> | indispensable | outdated | necessary |
|----------------------------|---------------|----------|-----------|



TACKLING ESSAY TESTS

Omit needless words. Vigorous writing is concise.

—WILLIAM STRUNK, JR., PROFESSOR OF ENGLISH;
CO-AUTHOR OF *THE ELEMENTS OF STYLE*

For many students, the thought of taking an essay test, of actually writing words “from scratch” instead of marking T or F or circling an option, is a terrifying prospect. Yet what these students don’t realize is that writing an essay puts them in control; they are not compelled to choose from among answers someone else has devised. With a solid strategy, any student can take the dread out of the essay test and put his or her knowledge into it. To help take the sting out of essay tests, this chapter provides advice on:

- Moving through the test systematically
- Learning the basics of writing an essay exam
- Writing effectively under time constraints
- Supporting your points

TACKLING ESSAY TESTS

Moving Through the Test Systematically

Make Notes on the Back of Your Exam Sheet

Jot Cues Beside Each Question

Read Exam Directions Carefully

Manage Your Time

Read All the Questions

Start with the Easiest Question

Learning the Basics of Writing an Essay Exam

Understand Each Question with Precision

Supply the Correct Answer

Writing Effectively Under Time Constraints

Get to the Point

Keep Your Writing Neat

Carefully Organize Your Essay

Supporting Your Points

Use Solid Evidence

Avoid Personal Opinions

Support General Opinions

Taking an essay test requires writing anywhere from a few paragraphs to several pages on each question. Unlike objective questions, which ask you simply to recognize correct information, essay tests require you to recall ideas and facts accurately and then to organize them into thoughtful, forceful responses to the questions. You do so by moving through the test calmly and systematically, by learning the basics of writing an essay exam, by writing effectively under time constraints, and by adequately supporting your points.

MOVING THROUGH THE TEST SYSTEMATICALLY

When an essay test is handed out, some students have difficulty resisting the temptation to jump right in and start writing. Confident students are often anxious to “get down to business” and show what they know; apprehensive test takers want to get the whole thing over with as quickly as possible. At first glance, these behaviors seem reasonable because time is limited. But if you take a few moments to plan a systematic response to the test, you’ll be a lot more efficient as a result. A little preparation saves you a lot more time than it uses.

Make Notes on the Back of Your Exam Sheet

As you walk into the exam room, your brain may be buzzing with information you want to include in your essays. Before you begin reading the test, unburden your mind by quickly jotting down on the back of the exam sheet the ideas, facts, and details you think you may forget. Almost like a summary of your summary sheets, these jottings act as cues for the Silver Dollar ideas you gleaned from your lectures and readings (see Chapter 5). Furthermore, the action of writing down these notes involves you in the exam immediately. But remember: You are graded for what you write on the *front* of the exam, so don’t spend more than a minute or so jotting down reminders on the *back*.

Read Exam Directions Carefully

Exam directions often contain specific instructions for answering the questions. They may establish the length of your answers (one paragraph, three hundred words, five pages), the approach that you should take (explain,

compare, contrast), the number of questions to be answered (say, four of the six presented), or time requirements (say, spend no more than fifteen minutes per question). If you miss such instructions, you will not only do a lot of needless writing and waste a great deal of time, but you may also invite criticism for carelessness.

Read All the Questions

Before you write anything, read all the questions. If you have a choice among questions, select those for which you are best prepared. If you have to answer every question, you'll know in advance which ones will require the most attention.

Jot Cues Beside Each Question

As you read through each question, underline or circle important words that provide clues for answering that question. Also, keep track of any key-words or keyphrases that come to mind by jotting them in the margin. Later, when you begin writing, use these jottings and those on the back of the exam sheet to help organize your answer.

Manage Your Time

Figure out roughly how much time you can spend on each question in order to complete the test. Stick as close to your time plan as you can, but don't become overly anxious or rigid about doing so.

If time is running out, outline the key points you were trying to make in any unfinished questions. Instructors sometimes award partial credit when you can demonstrate that you know the material.

If you finish early, use the surplus time to your advantage by going over your exam, double-checking your spelling and grammar, and, if necessary, inserting words, phrases, and examples that may make your essays clearer.

Start with the Easiest Question

Nothing inspires confidence and clear thinking more than getting off to a flying start with one question well answered. If the first question has you

stumped, don't let it deflate your morale and throw off your time plan. Just pick an easier question, number your answer correctly, and begin writing.

LEARNING THE BASICS OF WRITING AN ESSAY EXAM

To write an effective essay, you need to be able to understand each question with precision and to answer that question correctly.

Understand Each Question with Precision

A precise question requires a precise answer. Read each question carefully so you understand exactly what the question is asking. A good essay question is never vague or ambiguous. As you can see from Figure 16.1, words such as *criticize*, *interpret*, and *describe* have specific definitions. Therefore, if you have even the slightest uncertainty about what's being asked, don't hesitate to check with the instructor for clarification.

Supply the Correct Answer

Although they may require some specialized skills, essays are basically no different from any other type of question. To answer any exam question, you must have mastered your material. That means attending all lectures, reading all assignments, taking thoughtful notes, and then reviewing and reciting what you've written down until you know your information cold. Students who think they can "snow" their instructors with a long but fundamentally flawed essay are sadly mistaken. If your essay is missing the correct answer, this will be obvious to even the most inexperienced teacher.

A correct answer is often a correctly phrased answer. The tone you use or the approach you take in constructing the essay can have a strong influence on the grade you receive. Most instructors have favorite approaches and ways of looking at questions and are naturally, if not unconsciously, disposed to favor essays that correspond to their ways of thinking. Theoretically you shouldn't have to worry about this—the accuracy and thoroughness of your answer should be sufficient—but practically, an essay that incorporates some of the instructor's "pet ideas" is more likely to be viewed in a better light. According to respected educator Hugo Hartig, author of *The Idea of Composition*:

Key Word	Explanation
Apply a principle	Show how a principle works, through an example.
Comment	Discuss briefly.
Compare	Emphasize similarities, but also present differences.
Contrast	Give differences only.
Criticize	Give your judgment of good points and limitations, with evidence.
Define	Give meanings but no details.
Demonstrate	Show or prove an opinion, evaluation, or judgment.
Describe	State the particulars in detail.
Diagram	Show a drawing with labels.
Differentiate	Show how two things are different.
Discuss	Give reasons pro and con, with details.
Distinguish	Show main differences between two things.
Enumerate	List the points.
Evaluate	Discuss advantages and disadvantages with your opinion.
Explain	Give reasons for happenings or situations.
Give cause and effect	Describe the steps that lead to an event or a situation.
Give an example	Give a concrete example from the textbook or from your experience.
Identify	List and describe.
Illustrate	Give an example.
Interpret	State the meaning in simpler terms, using your judgment.
Justify	Prove or give reasons.
List	List without details.
Outline	Make a short summary with headings and subheadings.
Prove	Give evidence and reasons.
Relate	Show how things interconnect.
Review	Show main points or events in summary form.
Show	List your evidence in order of time, importance, logic.
Solve	Come up with a solution based on given facts or your knowledge.
State	List main points briefly without details.
Summarize	Organize and bring together the main points only.
Support	Back up a statement with facts and proof.
Trace	Give main points from beginning to end of an event.

FIGURE 16.1 Keywords in Essay Questions

This alphabetical list contains keywords encountered in the directions for essay questions, along with brief explanations of what each word means.

An alert student can easily identify these “pet ideas” and work them out carefully in his own words. The student who does this is prepared not only to see through the instructor’s questions quite readily, but he also knows exactly how to answer them, using the teacher’s own methods of problem solving! Perhaps this is the very essence of grade-getting in any course that depends heavily on essay exams.¹

WRITING EFFECTIVELY UNDER TIME CONSTRAINTS

As in all tests, time plays a key role in essay exams. Well-supported essays will earn you superior scores. But at the very least, use the available time to make certain your essay gets to the point, is carefully organized, and is neat.

Get to the Point

When you are writing an essay, there’s no time for obscuring facts in paragraphs filled with lavish adjectives or rambling discussions. Essay exams are written in a hurry and are often read in a hurry. You have to be concise!

Leave Off the Introduction A good way to guarantee that your essay will get to the point is to skip writing an introduction. Don’t even start off with a high-sounding sentence such as “This is indeed a crucial question that demands a swift solution; therefore. . . .” Such a general approach scatters your ideas, thereby damaging the unity of your answer. An unfocused essay may contain all the right ideas, but if those ideas are scattered, your instructor may conclude that you don’t know what you are talking about.

Put Your Answer at the Beginning Begin with a strong opening sentence that both repeats the question and provides the answer. The example in Figure 16.2 shows how this principle works. The opening part of the first sentence restates but rearranges the question, while the second part supplies the answer. Such an approach keeps you honest and discourages partial or unfocused answers.

¹Hugo Hartig, *The Idea of Composition* (Oshkosh, WI: Academia, 1974), p. 32.

Question: What does distributed practice involve?

Answer: Distributed practice involves dividing an assignment into several study sessions instead of one continuous session.

FIGURE 16.2 A Direct Answer

In Figure 16.3, the student has answered the question directly in the first sentence by naming three theories of forgetting. The rest of the essay follows a logical, predictable pattern in which she explains each theory in brief and then draws a conclusion about all of them.

Although the essay in Figure 16.4 is longer than the ones in Figures 16.2 and 16.3, its basic format is no different from that of the previous examples. In the opening sentence the student answers the question directly by comparing reciting and rereading and then by contrasting the two methods. The next sentence states three reasons reciting is superior to rereading, and the paragraphs that follow develop those points.

In longer essays you don't have to include your answer in the first sentence. But you should make sure it is contained in the opening paragraph. Once your answer has been stated at the beginning, you can devote the rest

Question: Identify three of the theories psychologists have suggested to explain forgetting.

Answer: Three of the theories that psychologists have suggested to explain how forgetting occurs include fading theory, retrieval theory, and reactive interference theory. Fading theory defines memories as paths or traces in the brain. According to the theory, if these paths aren't used (recalled) regularly, they fade until they eventually disappear (are forgotten). Retrieval theory claims that memories never really disappear; they simply get lost or misfiled, like important information buried under piles of paper on a messy desk. Reactive interference theory says that your attitude or emotions can interfere with your memory. If you are bored with or bothered by information, there's a greater chance that you will forget it. In certain cases, evidence seems to support all these theories of forgetting. But they remain only theories. None of them can be proved conclusively.

FIGURE 16.3 A Paragraph-Length Essay

Question: Compare and contrast reciting and rereading as methods of study.

Answer: Although reciting and rereading are both common methods of study, reciting is superior to rereading as a way of mastering your material. Unlike rereading, reciting (1) gets you involved, (2) supplies motivation, and (3) provides you with feedback on your progress.

1. Reciting gets you involved by compelling you to extract the meaning out of each paragraph you read. In contrast, it's possible to reread an assignment without understanding it.
2. Reciting supplies motivation because it encourages you to understand what you've read. If you had trouble grasping the meaning of one paragraph, you may be determined to have an easier time with the next one. If you understood a paragraph, you'll be motivated to continue your progress. But if you simply reread your assignment, you'll have no such incentive to succeed.
3. Because you know right away whether you've understood each paragraph, reciting provides you with immediate feedback on your progress. Potential trouble spots in your reading are brought to your attention right away. With rereading, the first real feedback you get is delayed until the test or quiz.

FIGURE 16.4 A Longer Essay Answer

of your essay to expanding on that answer. The ideas, facts, and details that follow all support your opening sentence or paragraph. As a result, your answer is both pertinent and unified.

Don't worry that by stating your answer so early in the essay, you will be "jumping the gun." There's no advantage to keeping a grader in suspense, not even for a few sentences. If your answer is not included in the first few lines, your point may never become clear. Even worse, if time runs out before you have finished your answer, that key concept you were carefully saving could go unused.

Avoid Wordy, Rambling Writing Essays that are overstuffed with big words, unnecessary adjectives, and rambling philosophical discussions will leave the reader both confused and suspicious. Complex ideas don't have to be expressed in a complicated way. According to Hartig, "Quite difficult and subtle ideas can be expressed in straightforward and simple language."² You don't have to use large words and flowery language to prove that you are knowledgeable. In fact, as Hartig points out, a flashy essay may even put

²Ibid.

your knowledge in question, instead of confirming it: "Any teacher who has read hundreds or thousands of papers becomes very sensitive to phoniness in student writing, because he sees so much of it."³ Don't write answers that are deliberately difficult or disingenuous. You won't fool anybody. Strive for clarity, sincerity, and simplicity.

Carefully Organize Your Essay

Organization comes easier when you leave off an introduction, put your answer at the beginning, and aim for simplicity and sincerity in your sentences. These elements provide a solid foundation for your essay's structure. Even so, you may want to take some extra steps to guarantee that the logic of your essay is easy to follow.

Use a Recognizable Pattern Instructors don't have time to treat each essay as a puzzle in need of a solution. Take the guesswork out of your essay. Make your answer clear and obvious by following a familiar organizational pattern.

The most straightforward way of organizing your essay is by using the decreasing-importance pattern (discussed in Chapter 8). Sometimes known as the inverted pyramid, this pattern starts off with the broadest and most important information and then gradually gets narrower in scope. The advantage of this pattern is that it states the most important information at the outset so the reader can pick it up right away. It also eliminates the risk that time will run out before you've had a chance to fit in your answer.

Of course, not all essay questions are tailor-made for the decreasing-importance pattern. Key terms in the question can give you a clue as to what sort of pattern is needed. If, for example, you are asked to summarize a particular event, you'll probably want to follow the chronological pattern, progressing steadily in your description from past to present. Start off in one direction and keep moving that way until you reach the end of the essay. The same advice applies to essays that call for the spatial or the process pattern. In a descriptive essay, move systematically from one end of what you're describing to the other. Follow a process in an unbroken path from its start to its finish. And if the question asks you to compare or contrast, make sure you shift back predictably between the things you're comparing or contrasting. Whether you use the decreasing-importance pattern or some other structure, it's crucial that you move through your essay systematically and predictably.

³Ibid.

Use Transitions The transitions that help make textbooks and lectures easier to follow can play a similar role in your essays, letting the reader know just where you're headed. When transitions lead from one idea to the next, the reader finds the essay clear, logical, and refreshing. A number of transitional words are listed in Figure 16.5.

End with a Summary Summarize your essay in a final sentence or two. Finishing off your essay with a summarizing conclusion ties your points

The experienced essay uses "trail markers," transitional words that provide directional clues for the reader and show the relationship between sentences in a paragraph. For example, the word *furthermore* says, "Wait! I have still more to say on the subject." So the reader holds the previously read sentences in mind while reading the next few sentences. The following list suggests other words and expressions that you might find valuable.

Transitional Words and Expressions	Intention or Relationship
<i>For example, in other words, that is</i>	Amplification
<i>Accordingly, because, consequently, for this reason, hence, thus, therefore, if . . . then</i>	Cause and effect
<i>Accepting the data, granted that, of course</i>	Concession
<i>In another sense, but, conversely, despite, however, nevertheless, on the contrary, on the other hand, though, yet</i>	Contrast or change
<i>Similarly, moreover, also, too, in addition, likewise, next in importance</i>	No change
<i>Add to this, besides, in addition to this, even more, to repeat, above all, indeed, more important</i>	Emphasis
<i>At the same time, likewise, similarly</i>	Equal value
<i>Also, besides, furthermore, in addition, moreover, too</i>	Increasing quantity
<i>First, finally, last, next, second, then</i>	Order
<i>For these reasons, in brief, in conclusion, to sum up</i>	Summary
<i>Then, since then, after this, thereafter, at last, at length, from now on, afterwards, before, formerly, later, meanwhile, now, presently, previously, subsequently, ultimately, since</i>	Time

FIGURE 16.5 Transitional Words and Expressions

together and reminds the grader of the original answer that you've devoted the rest of your essay to supporting.

These suggestions for organizing your essay become even more compelling when you learn how essays are actually graded. Figure 16.6 takes a brief look behind the scenes at an essay exam grading session.

Keep Your Writing Neat

In a carefully controlled experiment, a group of teachers were asked to grade a stack of examination papers solely on the basis of content. Unbeknownst to these instructors, several of the papers they were asked to grade were actually word-for-word duplicates, with one paper written in a good handwriting and the other in a poor one. In spite of instructions, on the average the teachers gave the neater papers the higher grades—by a full letter grade. Most instructors are unwilling to spend extra time interpreting sloppy

Behind the Scenes at an Essay Exam Grading Session

What happens after you finish your last essay, heave a sigh of relief, and hand in your exam? Although grading procedures may vary from school to school, here is how more than two hundred examination booklets in a popular introductory history course are graded at one college.

The day of the exam, each grader in the history department has time to scan, but not to grade, the answer booklets. Then at a meeting the next day, each grader reads aloud what he or she thinks is the one best answer for each question. A model answer for each question is then agreed on by the staff. The essential points in the model answers are noted by all the graders for use as common criteria in grading the responses.

Unfortunately, simply listing all the essential points in your essay won't automatically earn you a superior score. During the reading of the answers, one grader remarks, "Yes, this student mentioned points five and six . . . but I think he didn't realize what he was doing. He just happened to use the right words as he was explaining point four."

These comments reinforce the importance of crystal-clear organization in your essay. You may also want to underline the main point of the essay so it's obvious and mark off your subpoints with dark numbers. Don't forget to include transitional words to show how you got from one idea to the next. Make sure that no one thinks you just stumbled onto the correct answer.

FIGURE 16.6 The Essay Grading Process

papers. If your paper is messy, your meaning may be lost, and as a result your grade could suffer. Take these few precautions to ensure that your paper is neat.

Use Ink Most instructors ask specifically that you write your essays in pen, not pencil, so that they are bold and clear, not faint and smeary.

Write Legibly If your penmanship is less than it should be, then you should probably start using the modified printing style, explained in Chapter 10. The modified printing style is easy to learn and should enable you to write your essays quickly but neatly. Both qualities are crucial in an essay exam.

Write on Only One Side of Each Sheet When you write on both sides of the paper, the writing usually shows through, resulting in an essay that looks messy and that in some cases may even be unreadable. Besides, if your essays are written in an exam booklet, writing on only one side of each page can provide you with some last-minute room. Should you need to change or add something, you can write it on the blank page and draw a neat arrow to the spot where you want it inserted on the facing page.

Leave Plenty of Space A little extra space in the margins (especially the left-hand margin) and between your essays provides room for the grader to make comments and for you to add any important idea or fact that occurs to you later. These “late entries” can be blended into your original answer by using an appropriate transitional phrase, such as “An additional idea that pertains to this question is. . . .”

Guard Against Careless Errors Neatness goes beyond the readability of your handwriting and the appearance of your essay on the page. It includes an essay that is free of careless spelling and grammatical errors. As Hartig observes:

If you misspell common words, and make clumsy errors in sentence structure, or even if you write paragraphs that lack unity and coherence, many of your instructors are going to take it as a sure sign that you are sadly lacking in basic academic ability. Once a teacher thinks this about you, you will not get much credit for your ideas, even if they are brilliant.⁴

⁴Ibid.

SUPPORTING YOUR POINTS

A well-supported essay goes a long way in convincing graders that they are reading the work of a superior student. You can ensure that your essay is well supported by backing up your answer with solid evidence, by supporting general opinions, and by avoiding personal opinions.

Use Solid Evidence

Obviously, whether you answer an essay question correctly is important. But because a well-written essay usually contains the answer in the first sentence (or, in longer essays, the first paragraph), the bulk of your essay should be devoted to the evidence that supports your answer.

If you've mastered your material and included your answer at the start of your essay, then providing support should be relatively easy. Every sentence that follows the first one should provide supporting ideas, facts, and details. Notice how natural this approach is. Your first sentence addresses the question directly, and the sentence that follows outlines the major points that support your answer. Then subsequent sentences—or paragraphs, if your essay is longer—will provide examples, details, and further evidence for your initial answer and its major points. When everything you write pertains to the first sentence, you cannot help but achieve unity; all your sentences will be both pertinent and cohesive.

Support General Opinions

The evidence you supply should be factual, not opinionated. Even generally accepted opinions should be backed up with facts. According to Hartig:

An opinion that is not supported by some kind of logical or factual evidence is not worth anything at all, even if it is absolutely correct. For example, if you make the statement: "*Huckleberry Finn* is a masterpiece of American literature," and do not give any good reason to show that the statement is true, you get a zero for the statement.⁵

In the same way, you could expect to be marked off for writing, "John F. Kennedy has been the most popular president since the end of World War II." If, however, you wrote, "Based on an average of Gallup polls conducted during his presidency, John F. Kennedy had an approval rating of 70

⁵Ibid., p. 31.

percent, higher than any other president since the end of World War II," you'd be adequately supporting that opinion.

Avoid Personal Opinions

The opinions of "experts" have a place in an essay exam, but the same can't be said for your own opinions. All of us have personal opinions, but unless a question specifically asks for yours, leave it out of your essay. The purpose of essay exams, after all, is to see what you've learned and how you can apply it.

SUMMARY

What's the best way of tackling an essay test?

If you move systematically through the test, understand what writing an essay exam requires, work effectively within the time given, and substantiate your answer, you are more likely to tackle an essay test successfully.

How do you move systematically through an essay test?

Before you begin writing, jot down any key ideas, facts, and details you think you might forget. Then study the directions carefully, look over all the questions, and develop a rough time schedule for each question. Answer an easy question first to build your confidence and momentum.

What are the basic skills needed to answer an essay question effectively?

Most instructors expect your essay to demonstrate that you have understood the wording of the question and, of course, that you can arrive at the correct answer. Also, from a practical standpoint, an essay that incorporates some of the instructor's favorite ideas or approaches is more likely to be viewed in a better light.

How do you demonstrate that you can write well under time pressure?

If your essay makes its point quickly and is well organized and neat, you will convince most instructors that you can write well in a limited amount of time. To get to the point, omit any introduction, answer the question at the very start, and don't use

How can you ensure that your answer is well supported?

any more words than are necessary to make your case. Structure your essay around a recognizable pattern, make sure that pattern is well marked with transitions, and restate your answer at the end. Finally, don't underestimate the importance of neatness. The appearance of your essays can affect your grade.

By answering the question at the beginning, you can devote the rest of your essay to supporting that answer. Back up every point you make with solid evidence. Support general opinions as well. Do not include personal opinions; the purpose of an essay is to show what you've learned, not what you believe.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words listed below each sentence.

1. In essay questions, you are graded on your _____.
reasoning opinions decisions
2. Your answer to an essay question must demonstrate that you understand the _____.
facts dates directions

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------|---|
| _____ 1. Suspense | a. Often provide specifics on how each question should be answered |
| _____ 2. Directions | b. The best approach to writing essay answers |
| _____ 3. Simplicity | c. Narrows gradually in an essay written in the decreasing-importance pattern |
| _____ 4. Space | d. Unnecessary and undesirable in essay answers |
| _____ 5. Scope | e. Can be employed to make your logic more transparent |

- _____ 6. Transitions
- f. Allows room for late additions as well as for instructor's comments

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. You should develop a time plan for taking your test and then follow it strictly.
- _____ 2. It's a good idea to read all the questions before you begin writing.
- _____ 3. Leftover time should be used for double-checking your answers.
- _____ 4. The appearance of your essay will have no influence on the grade you receive.
- _____ 5. Instructors prefer that you write in ink because it makes your answers easier to read.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. Jotting down notes on the back of the test sheet
- a. gets you involved right away.
 - b. is usually not permitted in an essay exam.
 - c. takes time that could be better spent.
 - d. will often gain you partial credit.
2. In an essay test, it helps to start off with the question that is
- a. most difficult
 - b. first
 - c. last
 - d. easiest
3. Keywords in an essay question should be
- a. paraphrased.
 - b. circled.
 - c. discussed.
 - d. replaced.
4. You'll help prove that you write well under time constraints if your essay is
- a. concise.
 - b. well organized.
 - c. neat.
 - d. all the above.

5. A good way to ensure that your essay gets right to the point is by
 - a. leaving off the introduction.
 - b. writing telegraphic sentences.
 - c. avoiding complicated words.
 - d. scattering your ideas.
6. In a sharply focused essay, a strong opening sentence
 - a. restates the question.
 - b. provides the answer.
 - c. helps unify the answer.
 - d. does all the above.
7. Poor handwriting can be improved through the use of
 - a. the modified printing style.
 - b. every other line of your exam booklet.
 - c. a pencil instead of a pen.
 - d. all the above.
8. Key points in an unfinished essay should be
 - a. outlined.
 - b. combined.
 - c. included.
 - d. deleted.

Short answer. Supply a brief answer for each of the following items.

1. Why are some students particularly nervous about taking essay exams?
2. What should you do if you are unable to finish an essay answer before time runs out?
3. Explain the role of precision in taking an essay exam.
4. What constitutes a "neat" essay?
5. How should opinions be treated in an essay answer?

THE WORD HISTORY SYSTEM

enthrall en-thrall' v. 1. To hold spellbound; captivate. 2. To enslave.

Enthrall *literally, to enslave*



Enthrall presents another case of a word the original and literal sense of which is cruel, but the modern, figurative use of which is much more pleasant. When we say that we are *enthralled* by a song, or a book, or something else with captivating charm, it is interesting to remember that the original meaning of the word was "to enslave." *Thrall* is Anglo-Saxon for "slave." To *enthral* meant, therefore, "to enslave," "to reduce to the condition of a thrall." The literal sense of "enslave," "make captive," easily yields a figurative sense, "captivate the senses," "hold spellbound," "charm," as with a song or a story.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

We hold these truths to be *self-evident*, that all men are created equal, that they are *endowed* by their Creator with certain *unalienable* rights, that among these are life, liberty, and the *pursuit* of happiness.

—Thomas Jefferson (1743–1826), third president of the United States

- | | | | |
|------------------------------|-----------|-----------|-------------|
| 1. <i>self-evident</i> | genuine | effective | obvious |
| 2. <i>endowed</i> | provided | developed | established |
| 3. <i>unalienable</i> rights | lawful | intrinsic | earned |
| 4. <i>pursuit</i> | enjoyment | search | goal |

Diplomacy is the art of saying "nice doggie" until you can find a rock.

—Will Rogers (1879–1935), American actor and humorist

- | | | | |
|---------------------|----------|------------|------|
| 5. <i>diplomacy</i> | trickery | cleverness | tact |
|---------------------|----------|------------|------|

There is nothing *sinister* in so arranging one's affairs as to keep taxes as low as possible.

—Judge Learned Hand (1872–1961), American jurist

- | | | | |
|----------------------------|---------|------|------|
| 6. nothing <i>sinister</i> | illegal | easy | evil |
|----------------------------|---------|------|------|

Capitalism is *humanitarianism*.

—Margaret Thatcher (1925–), former prime minister of Great Britain

- | | | | |
|---------------------------|--------------|--------------------|---------------|
| 7. <i>capitalism</i> | development | free
enterprise | democracy |
| 8. <i>humanitarianism</i> | philanthropy | impermanent | materialistic |

STUDYING MATHEMATICS

Would you have a man reason well, you must . . . exercise his mind [and] nothing does this better than mathematics.

—JOHN LOCKE (1637–1704), ENGLISH PHILOSOPHER

Mathematics has always been a prerequisite for dozens of subjects. Now it seems to be a prerequisite for simple survival. Whether you feel proficient at mathematics or not, this chapter can be of help. It discusses:

- Traditional versus contemporary mathematics instruction
- How to remedy a weak background
- How to develop good study skills
- How to develop strategies for problem solving
- How to attack nonroutine problems
- How to develop understanding and memory in mathematics

STUDYING MATHEMATICS

**How to Adjust to
Traditional vs
Contemporary
Mathematics**

Emphasizing
Problem Solving

Emphasizing Con-
ceptual Engagement

Studying in
Small Groups

**How to Remedy
a Weak
Background**

Using Your Old
Textbooks

Using New
Workbooks

**How to Develop
Good Study
Skills**

Keeping
Up to Date

Taking Notes
in Class

Using Your
Textbook

Using Mathe-
matical Tools

Studying for
Examinations

**How to Develop
Strategies for
Problem Solving**

Substitute
Some Numbers

Sorting Out
the Problem

Drawing a Diagram
or Sketch

Making Use of
Your Calculator

Implementing
Your Analysis

Check Your
Results

**How to Attack
a Nonroutine
Problem**

Reading Problems
Twice

Sorting Out
Facts

Recalling Similar
Problems

Restating
the Problem

Trying to Solve
Part of Problem

Working a Problem
Backward

**How to Develop
Understanding
and Memory in
Mathematics**

Memorizing

Understanding

Applying Skills

Problems are intriguing, and most people enjoy solving them. Try this.

Problem:

At exactly 2:00, two bacteria are placed in a growing medium. One minute later there are four bacteria, in another minute eight bacteria, and so on. At exactly 3:00, the growing mass of bacteria measures one gallon. At what time was there one pint of bacteria?

Is this a puzzle or a mathematical problem? It's like a mathematical problem because its solution requires some analysis and some computation. But it's really more of a puzzle. You have to see, first, that the number of bacteria doubles each minute and, second, that you must compute backward from one gallon at 3:00 to get one-half gallon (four pints) at 2:59; two pints at 2:58; and the required one pint at 2:57.

Doing mathematics is a form of problem solving that makes use of the most efficient methods—methods that have been developed over the centuries. That's why it is applicable to so many other subject areas. Once you see the usefulness of mathematics, you'll study and learn it more surely and enthusiastically.

TRADITIONAL VERSUS CONTEMPORARY MATHEMATICS INSTRUCTION

Compared with your prior mathematical experiences, college-level mathematics courses may present totally new demands. You may find that your previously held conceptions of what mathematics is and what it means to “do mathematics” seem out of place in the contemporary college mathematics classroom. Changing the way you have always thought about and done mathematics is essential for ensuring your future success.

Today, more than ever, mathematics instruction is emphasizing the importance of problem solving. Solving problems is different from completing exercises. The latter merely requires you to apply some previously memorized procedure to a problem that may already be familiar but uses different numbers or different contexts. Although completing exercises involves mathematical skill, these skills are generally procedural in nature and can be applied in a somewhat rote or mechanical fashion.

In contrast, problem solving typically requires several steps, the first of which is to figure out the “problem in the problem”—that is, what it is in the problem that needs to be solved. You must solve a problem different in form and flavor from ones you have solved before and use a higher, more

conceptual level of engagement. You may be required to present more than one solution to the problem, justify your solutions in writing, or present your findings to others. In short, problem solving involves much more than “finding the right answer.” You may have to be more persistent.

HOW TO REMEDY A WEAK BACKGROUND

College work in mathematics is the continuation of a learning program that began in the elementary grades with the first operations of arithmetic and continued through junior and senior high school with algebra, geometry, trigonometry, and possibly calculus. College courses expand and extend this sequence. Each subject builds on previous subjects, and at each stage in the program you must be prepared to use all the mathematics you have studied previously. If at some point you have difficulty with mathematics, it is almost always because you have not fully mastered some earlier principle or process.

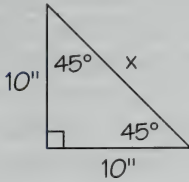
What can you do about a shaky background in mathematics? One thing you *can't* do is start all over again—at least, not on top of your regular course load. Even a thorough review would likely take too much of your time. There are, however, two practical ways to identify and strengthen weak spots or fill in gaps: spot reviewing and self-diagnosis.

First, attack each difficulty as it arises. Whenever you come to a computation process or formula or principle that you don't recognize or don't understand, clear it up so that it won't bother you again. Because you have an immediate need for that material, you have an incentive to master it. This is a good way to get the exact mathematics review that you personally need. It is also a very practical plan for someone who is experiencing only occasional difficulty with a mathematics course or with mathematics used in other courses.

To do this kind of spot reviewing, you should have at hand textbooks covering all the mathematics you've learned—from arithmetic on. The best review books are those you studied from, but they may be difficult to get. Your college library or bookstore might have some texts that are similar; otherwise, your best bet is standard review books. You can also check the library or computer lab for computer-assisted programs that can help you both to diagnose those areas in which you need more work and to get the practice you need. When you review, try to understand the underlying concept or principle as well as the mechanics. Note both on a 3×5 card (see Figure 17.1); it will help you remember and will come in handy when you study for exams.

PROBLEM

Given an isosceles right triangle with legs equal to 10".
What is its hypotenuse?

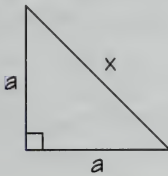


Isosceles right triangle has two 45° angles, equal legs.

$$x^2 = 10^2 + 10^2 = 200$$

$$x^2 = \sqrt{200} = \sqrt{100} \sqrt{2} = 10\sqrt{2}$$

Generalized:



$$x^2 = 2a^2$$

$$x = a\sqrt{2}$$

FIGURE 17.1 Card for Background Review

The second way to strengthen weak spots in your background is by diagnosing your mathematical competence. Work your way through a self-help review book or computer program to discover what topics you need to study and practice.¹ By building your understanding in each area of difficulty, you will avoid getting into trouble at more advanced levels. But you must follow through. Attack even minor weaknesses as soon as you discover them.

In addition, remember that everyone has strengths and weaknesses. You may find it useful to have a study partner or to join a small study group. Regular meeting times during the week for reviewing or working homework problems can be very beneficial.

Many college mathematics instructors today encourage cooperative learning or require group activities or projects in their courses. If you find that your mathematics background is weaker than your partner's, don't be intimidated or let your partner take over. If you are not sure of something, say so! Be sure that you are an active and contributing participant in any group process.

¹A good review workbook is M. Wiles Keller and James H. Zant, *Basic Mathematics*, in 4 volumes, 4th ed. (Boston: Houghton Mifflin, 1984). It covers arithmetic, algebra, and trigonometry and contains diagnostic tests from which you can determine your strengths and weaknesses.

HOW TO DEVELOP GOOD STUDY SKILLS

The change from secondary school to college is greater in mathematics than for any other area of study. In college, you'll have to work exercises on your own, practicing operations and manipulations to achieve mastery and understanding. Most of this work will not be for credit: Your reward will be your growing proficiency in thinking your way through the problems.

There is good reason for learning to be self-directed in mathematics. Unless you're a mathematics major, you may have to take college-level mathematics because it is a prerequisite for coursework in your major and/or a graduation requirement. Most college courses presume a certain level of quantitative competency on the part of their students, and it will be up to you to develop these competencies and apply them to the task at hand. To learn these competencies, you must learn to keep up to date, take notes in class, use your textbook, become proficient in the use of mathematical tools (calculators, graphing software, and the like), and study for exams. Take a course or workshop on the use of calculators if you need to.

Keeping Up to Date

Because mathematics is a cumulative subject in which you must be prepared at any point to use anything or everything you have previously learned, and because it is a subject in which understanding of concepts is required to master essential operations, it is absolutely necessary to keep your work up to date. If you fall behind, you'll be lacking some of the background on which the newest material is based, in which case you'd have to take time from your study of current material to catch up.

Taking Notes in Class

The general principles of note taking discussed in Chapter 10 apply to mathematics lectures and class discussion. There is, however, a major difference. You should keep your math notes to a minimum so that note taking doesn't prevent you from following the instructor's line of reasoning. Record main ideas about how to attack particular kinds of problems and jot down the individual steps in each solution. Note *how* a theorem is derived rather than its complete derivation. But do follow carefully as the instructor solves each problem and derives each theorem.

If the lectures are closely related to the textbook, read ahead before each lecture. You then can judge to what extent the lecture repeats and to what extent it supplements the text and can take notes accordingly. You might even want to keep your textbook open and write supplementary or

clarifying information right on the book pages. If you do read ahead, expect to read again, more carefully, after the lecture.

If you lose the thread of a lecture or class discussion, or if you fail to understand a line of reasoning or a mathematical procedure, ask your instructor for clarification. Failure to clear up even a minor point may lead to major difficulties later. You'll have to do *your* part, though, by doing the required advance preparation and giving the instructor your full attention during the class period.

To provide maximum reinforcement for classroom learning, study your notes and the related text material and examples as soon after class as possible. Do the drill problems only when you are sure you understand the material. Working at an assignment before you are ready for it wastes time and—worse—can cause you to remember incorrect solution procedures.

Using Your Textbook

Your textbook is a very useful learning device—if you employ it correctly. You must read mathematics texts with great care. Mathematical terms and symbols are defined with great precision; each word has an exact meaning and only that meaning. Each term can also incorporate a number of other definitions and theorems that are part of its own definition.

Consider, for example, the square, a geometric figure. No doubt you can easily imagine a square and draw a reasonable representation of one. But what would the term *square* mean to you if you saw it in your textbook? A reasonable definition of a square is “a regular polygon of four sides.” To a mathematician, “regular polygon” means that all the sides are equal in length and all the angles are equal in measure; it also implies, among other things, that the diagonals are equal in length. The expression “polygon of four sides” means that the sum of the interior angles is 360° . Because each angle is equal in measure, each angle measures 90° and is a right angle. There's more, but by now you get the point: Even a simple term like *square* can stand for a wealth of information. Mathematics writers choose their terms with great care to state precisely what they mean. As a reader of mathematics, you must make sure—by reading carefully—that you understand precisely what the writer means.

Don't carry confusion along with you as you read. If you don't recall a term or concept that the author mentions, or if you can't easily define a term or concept for yourself, then stop reading. Look up the term or concept, and make sure you understand it before you go on. Review it if you have to. Do the same for operations that you're unsure of, such as adding fractions or taking a particular kind of derivative. If you can't follow the author's computation, look it up.

Read with a pen and plenty of paper at hand, and do all the computations along with the author of your textbook. Do every step in each computation—including all the worked-out examples as you come to them—so that you become comfortable with the process. You can't know what a computation process is like if you read it but don't *do* it.

When you understand the material and have a feel for the mechanics, do some problem solving. Do your homework assignment if you have one or the odd-numbered exercises if you are working on your own. Look up the answers if they are available, and rework any exercises you got wrong the first time around (after trying to find where you went wrong). If you can't get the listed answer after two tries, stop and make a note to ask your instructor about the problem.

Using Mathematical Tools

Most colleges and universities today have responded in some way to the calls for reform in mathematics education. One significant aspect of these reforms is the use of intelligent "tools" in mathematics courses: scientific calculators, graphing calculators, and mathematics software for computers. As a result, the content of many courses is changing, with greater emphasis on problem solving and applications that require the use of computers or calculators.

You must be familiar with the technological tools you are required or allowed to use. Many students are unaware of the computing potential of their calculators. Read the instruction manual that came with your calculator or math software, and keep it nearby so that you can refer to it often. The more familiar you are with such tools, the more competent you will be at using them to your advantage. Make sure you know the instructor's policy on the use of calculators on examinations. Don't overrely on your calculator; know how to approach and solve problems without it. Finally, always estimate the answers to the problems you are solving, and use these estimates to judge the answer you compute with your calculator. It's all too easy to make a keystroke error when entering or manipulating data and arrive at an incorrect solution as a result.

Studying for Examinations

The best way to study for an examination is to keep up with your daily work throughout the term. Then at examination time you can polish up what you already know.

Start early to review the problems you have had in assignments and previous tests, paying special attention to the more troublesome ones. This will

give you a chance to ask your instructor for help if you are still unsure of some procedures. Review any 3×5 cards you made up as part of your background-repair effort.

You may also find 3×5 cards useful for memorizing important formulas and principles that you won't be able to look up during examinations (see Figures 17.2 and 17.3). Record one item to a card, and carry the cards around with you to study throughout the day. Be sure, however, that you understand the *meaning* of material you memorize in this way, so that you can still work the problem even if you forget the details. Consider a formula a convenience or a shortcut, not an end in itself.

Whenever you get back a test or examination, rework the problems on which you made mistakes, and find out what you did wrong. Correcting your errors is one of the most valuable learning experiences you can have. You may want to draw up some review cards for these errors, to use in studying for later examinations.

PRACTICAL SUGGESTIONS FOR PROBLEM SOLVING

Solving a mathematical problem is basically a two-part operation. First you analyze, and then you compute. If you fail to size up the problem correctly,

IMPORTANT FORMULA:

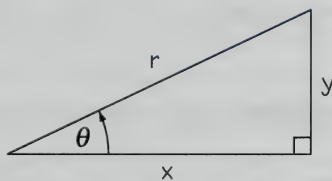
$$\cos^2 \theta + \sin^2 \theta = 1$$

Derivation:

$$x^2 + y^2 = r^2$$

$$\frac{x^2}{r^2} + \frac{y^2}{r^2} = 1$$

$$\cos^2 \theta + \sin^2 \theta = 1$$



Divide both sides by r^2

$$\text{since } \cos \theta = \frac{x}{r}$$

$$\text{and } \sin \theta = \frac{y}{r}$$

FIGURE 17.2 Card for Memorizing Formulas

SOLVING INEQUALITIES

If both sides of an inequality are multiplied or divided by the same positive number, the direction of the inequality is not changed. However, when multiplying or dividing by a negative number, the direction is reversed.

Ex. #1: Since $10 > 8$, $3 \cdot 10 > 3 \cdot 8$, or $30 > 24$

Ex. #2: $6 < 18$, but $\frac{6}{-3} > \frac{18}{-3}$ or $-2 > -6$.

FIGURE 17.3 Card for Memorizing Principles

you can't compute your way to the correct solution. On the other hand, an error in calculation—whether from carelessness or from inadequate understanding of the basic operations—can cancel out even a brilliant piece of analysis.

As the first step in doing any problem, read it through twice—*carefully*. This will keep you from jumping into the problem too quickly.

Substitute Some Numbers

When the numbers involved in a problem are so large, so small, or so complicated that they interfere with your analysis of the problem, try substituting simpler numbers. This will often reveal the nature of the problem more clearly.

Problem:

If the mass of an electron is about 9×10^{-28} grams, and the mass of a proton is about 1.62×10^{-24} grams, approximately how many times the mass of an electron is the mass of a proton?

This problem can easily be sorted out, but then what? If you're unsure about which operation to perform, substitute numbers that are less difficult to work with. Here, let the proton weigh 16 grams and the electron weigh

2 grams. Then the proton obviously weighs $16/2 = 8$ times as much as the electron.

Our analysis tells us to divide proton weight by electron weight, so we calculate

$$\frac{\text{Proton weight}}{\text{Electron weight}} = \frac{1.62 \times 10^{-24} \text{ g}}{9 \times 10^{-28} \text{ g}} = 1.8 \times 10^3$$

Sort Out the Problem

Begin your analysis by noting what information is given, what relationships are stated or implied, and what is to be found or proved. Underline important points in the problem, or jot them down for easy reference.

Next, figure out how to get from the information you are given to what you need. (Don't do any calculating yet; this is a planning step.) You may find it useful to write down anything that is intermediary; that is, what you have to find in order to find what is required.

For example, suppose you were given the following problem:

A publisher of college mathematics textbooks is planning to market a new textbook. She figures the fixed costs (e.g., overhead) to publish the book are \$190,000, while the variable costs (i.e., costs per book, such as materials, printing, etc.) will average \$16.00 per book. The book will sell to campus bookstores for \$36 per unit. Compute the number of books the publisher will need to sell in order to break even. Your analysis might look like this:

Given: Fixed cost (\$190,000), variable costs (\$16.00/book),
selling price (\$36.00/book)

Find: Break-even point

To solve this problem, you must know what is meant by a break-even point. This is usually defined as the point at which the revenue generated by doing business is the same as the cost of doing business; that is, when revenue equals cost. Thus, you know what is needed to solve the problem:

Need: A cost function $C(x)$; a revenue function, $R(x)$; the break-even point will be the value of x such that $C(x) = R(x)$.

First, generate the cost function, which will be made up of the fixed cost plus the variable, or "per book," cost. If x = number of books published, then

$$C(x) = 190,000 + 16x$$

The revenue function will be \$36 times the number of books sold, or

$$R(x) = 36x$$

Finally, set $C(x) = R(x)$:

$$\begin{aligned} 190,000 + 16x &= 36x \\ 190,000 &= 20x \\ x &= 9,500 \end{aligned}$$

Thus, the break-even point is 9,500; that is, the publisher needs to publish and sell 9,500 books to break even.

By analyzing what you need to find, you can often determine a plan of action and know which intermediary steps are required to solve the problem.

Draw a Diagram

A diagram can highlight relationships and facts that are not very evident from statements alone. In the cost–revenue problem, for example, a sketch of the cost function and the revenue function may illustrate the need to find the intersection, P , of these two equations in Figure 17.4.

The diagram also shows us how to interpret our answer. Here $x = 9,500$ is the x -coordinate of the point of intersection. Thus, the output of the cost function when $x = 9,500$ is the same as the output of the revenue function when $x = 9,500$: $C(9,500) = 190,000 + 16(9,500) = 342,000 = 36(9,500) = R(9,500)$. The coordinates of the point P are $(9,500, 342,000)$.

Sometimes a rough sketch is enough to give you insight on how to set up and solve a problem. In other cases, a more precise graph is necessary. Be sure that you have and use the necessary materials to do a careful graph: ruler, graph paper, or graphing utility. When you make a graph, be sure to label the axes, so that you (or whoever may grade your work) are clear about what the graph represents. Consider the following problem:

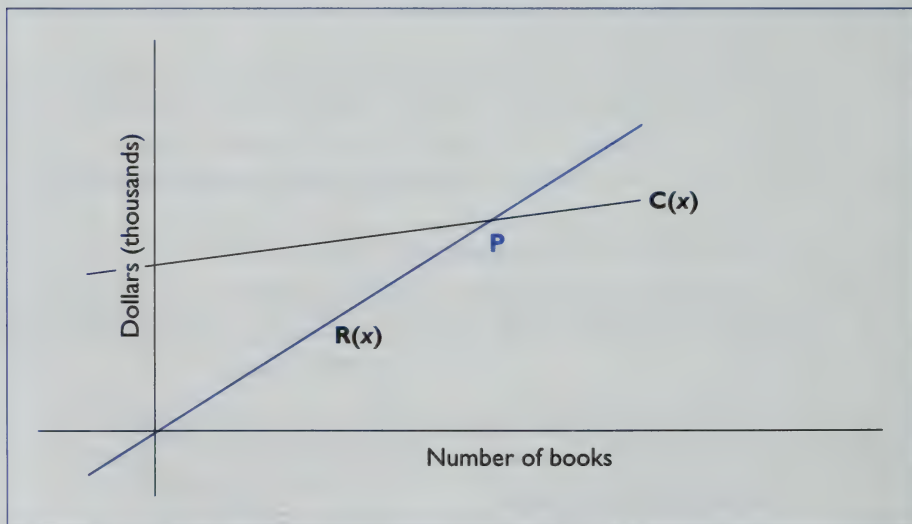


FIGURE 17.4 Cost–Revenue Diagram

A hot-air balloon is floating over a highway. To figure out their height, the balloonists measure the angle of depression to the milepost behind them to be 38° , while the angle of depression to the milepost ahead of them is 53° . What is the height of the balloon?

First sort out the problem:

Given: Angles of depression = 38° and 53° ; distance between posts = 1 mile

Find: Height of balloon above ground

To sketch this problem, we need to know the definition of angle of depression. We are given the measure of these angles, as well as the distance between mileposts (1 mile). The diagram might look like Figure 17.5.

The danger with this diagram is that the triangle looks nearly like an isosceles triangle, which would imply that the height, h , divides the triangle into two congruent parts. If this were true, the base of the triangle would be divided in half, into segments measuring 0.5 mile each; then the problem could be easily solved by solving the equation $\tan 38^\circ = h/0.5$ for h . However, if this were an isosceles triangle, the base angles would be equal to each other, which they are not. If we were to draw the diagram a little more accurately (as in Figure 17.6), the 53° angle would be drawn bigger than the 38° angle; then it would be clear that the base of this triangle is not bisected.

Now it is obvious from the diagram that the base is not bisected when we drop a perpendicular to the base, and the first solution path is not feasible. (To solve this problem, we could use the law of sines to find a or b , then find h using this intermediary information.)

Another effective technique, especially in word problems leading to equations, is to choose an answer first and use it to figure out what procedure is involved. For example, in the book-publishing example, choosing a

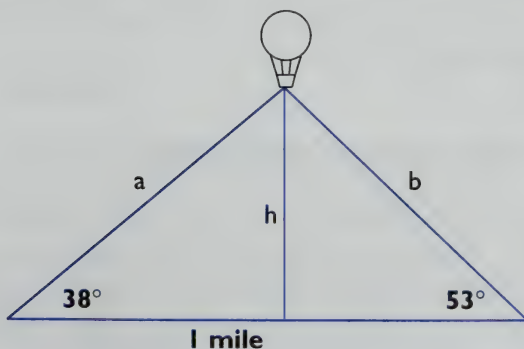


FIGURE 17.5 Diagram for Balloon Problem 1

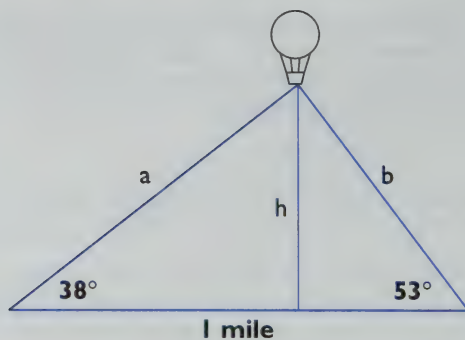


FIGURE 17.6 Diagram for Balloon Problem 2

possible number of books for the answer may aid in finding the equations for the cost and revenue functions. Imagine that the break-even point occurs when 5,000 books are published and sold. The cost to publish 5,000 books would be $\$190,000 + \$16(5,000) = \$270,000$, while the revenues earned selling these books would be $\$36(10,000) = \$180,000$. From these calculations we can see that unless more books are published and sold, the publisher will lose money. Trying another possible answer, say, 10,000 books, leads to $\$190,000 + \$16(10,000) = \$350,000$ in publishing costs, but $\$360,000$ in earned revenues. By generalizing on the process of determining the costs and revenues for a particular number of books, you can derive the cost and revenue functions. Furthermore, since these are linear functions, you can see that the break-even point must lie somewhere between 5,000 and 10,000 books and must be closer to the latter number.

Substituting numbers is also helpful when you are unclear how to simplify your calculations. For example, consider the expression $\sqrt{x^2 + y^2}$. Does this expression simplify to $x + y$? To determine this, try substituting, say, 1 for x and 2 for y : $\sqrt{1^2 + 2^2} = \sqrt{5} \neq 1 + 2$. Since you have found a combination of numbers for which the statement is not true, you can conclude that, in general, $\sqrt{x^2 + y^2} \neq x + y$.

Make Use of Your Calculator

You will use your calculator to do most of the calculations for math problems. If you don't have a calculator, you're at a disadvantage. It removes the tedium from calculations, speeds them up, and thus gives you more time both for analysis and for doing problems. Most college math courses require you to have and know how to use a calculator.

A calculator can also be useful in the analysis stage of problem solving. In particular, it can help you test a formula or identify one that you're not

sure of. Suppose you need the formula for $\cos 2\theta$ but can't remember whether it's $2 \cos^2 \theta - 1$ or $1 - 2 \cos^2 \theta$. To find out, simply pick a value for θ and then use your calculator to compute all three expressions. You find that the computed value for $2 \cos^2 \theta - 1$ is the same as that for $\cos 2\theta$, and you have your formula.

Although your calculator is a valuable tool, it is *only* a tool and cannot substitute for mathematical understanding. Consider the problem $y = \log_5 30$. You can solve this problem with any scientific calculator by applying the change of base formula: $\log_5 30 = \frac{\log 30}{\log 5} \approx 2.113$. Therefore,

to compute $\log_5 30$, you must find $\log 30$ and divide it by $\log 5$. Without the change of base formula, you can still come up with a decent approximation of $\log_5 30$ by knowing how to rewrite a logarithmic equation in exponential form. The given equation $y = \log_5 30$ can be rewritten as $5^y = 30$. Since $5^2 = 25$ and $5^3 = 125$, the power (log) that you must raise 5 to in order to get 30 will be a little more than 2. Using the x^y (or y^x , depending on your calculator) key, substitute 5 for the base and different values around 2._____ for the exponent until you get a result that is sufficiently close to 30.

Implement Your Analysis

Your analysis of the problem is complete when you clearly understand how to proceed from what is given to what is required. Then do the calculations that implement the analysis as you developed it. Don't try a new idea once you've started calculating—a shortcut, for example. Because you have not thought it through, it could lead you astray.

If you do want to try a different method—one that seems more elegant, perhaps, or that requires less work—do so. But do so only after you have made it part of a complete, start-to-finish analysis of the problem.

Check Your Results

Get in the habit of checking your answer every time you complete a problem. One or more of the following checks will usually apply to every type of problem:

1. Substitute your answer for the unknown in the problem, to make sure it satisfies the given conditions. This check is especially applicable to word problems and problems in the form of questions.

2. Rework the problem by an alternative method. (You've got to know another solution method before you can use this check.)

3. Check the units in your solution. In the hot-air balloon problem, for example, the base of the triangle in your diagram is 1 mile. Thus, your solution for the height of the balloon will be some portion of a mile. If the problem requires you to express your answer in feet, you need to multiply your answer by 5,280 (since 1 mile = 5,280 feet).

4. Estimate the answer before you do the computation. Then make sure the estimate and the answer are of about the same magnitude. This check, too, can be used for the majority of numerical problems.

5. If you work with a study partner or group, compare solutions. If your textbook comes with an optional student solutions manual, buy it; look up the solution to the given problem (or similar problem) and compare it with your solution. Often the solutions will look different, but both may be correct. The process of reconciling multiple approaches to a problem can lead to even greater understanding of the problem and to flexible thinking, which is important for the problem-solving process.

Checking can reveal errors in both analysis and computation. It will also help you understand what you are doing. Although checking might seem to be a duplication of effort, it really isn't. Rather, it is a quality-control operation that can enhance your problem-solving ability and your examination grades.

How to Attack a Nonroutine Problem

A nonroutine problem is different from the problems you may be used to solving. It can range from the slightly unusual to the unique and often is composed of many parts. Mathematics instructors often assign such problems to foster problem-solving skills and to test and extend your ability to apply what you have learned. To illustrate, consider the following problem, which may seem nonroutine to you:

Problem:

The relationship between air temperature T (in $^{\circ}\text{F}$) and the altitude h (in feet above sea level) is approximately linear. When the temperature at sea level is 60° , an increase of 5,000 feet in altitude lowers the air temperature about 18° .

- Find an equation that expresses T as a function of h (write your answer in general form);
- approximate the air temperature at an altitude of 13,000 feet; and
- approximate the altitude at which the temperature is only 10°F .

The first step is to read the problem carefully, from beginning to end. The second step? Read the problem again! You should conclude that this problem requires you to (1) write an equation that relates one variable to another, then (2) use this equation to predict the value of one variable when you know the value of the other variable. An equation written to fit observed data can be called a mathematical model. Mathematical modeling, or constructing equations that fit given data, is an important component of problem solving.

To help sort out the problem and organize the given information, it is useful to build a table for the given data. Since you have two variables, one for temperature (T) and one for altitude (h), make a table with two columns, and enter your given information in the appropriate columns:

T	h
60	0 (the height at sea level)
42	5000 (since $60^\circ - 18^\circ = 42^\circ$)

Since you are told that the relationship will be linear, you know that you need to find an equation in the form $y = mx + b$ that will give you correct output for the given output.

Note that you are asked to find an equation that expresses T as a function of h . This means that you must be able to compute T if you are given an h value. Thus, you know that the *input* variable should be T and the *output* variable should represent h ; since the relationship is linear, this means $h = mT + b$. It may be useful, then, to reverse the columns, making the input the first column and the output, the second column:

Given information, rearranged:	h	T
	0	60
	5,000	42

Now that you have organized your given information, decide what you are asked to find, and what will be needed to do this:

Find: A linear equation through the given data points

Need: The slope (m) and the y intercept (b) of the line

Recall that m is defined as the slope of a straight line, and defined as $\frac{y_2 - y_1}{x_2 - x_1}$; b is defined as the y intercept, the value of y when $x = 0$.

We can now compute the slope and y intercept for the line through the given data:

$$m = \text{slope} = \frac{T_2 - T_1}{h_2 - h_1} = \frac{42 - 60}{5,000 - 0} = \frac{-18}{5,000} = -.0036$$

$$b = \text{value of } T \text{ when } h = 0: 60$$

Thus, the desired equation is $T = -.0036h + 60$. Check the equation by substituting the given data pairs for h and T .

Note that question (b) asks for a temperature, given a specific height, while question (c) asks for a specific height, given a specific temperature. Both (b) and (c), then, require you to use the equation you constructed in question (a) to compute specific values.

For part (b), given the altitude (h) is 2000, find T :

$$T = -.0036(13,000) + 60 = -46.8 + 60 = 13.2 \approx 13^\circ$$

For part (c), given the temperature is 6° F, compute the height:

$$\begin{array}{ll} 6 = .0036(h) + 60 & \text{subtract 60 from both sides} \\ -54 = -.0036h & \text{divide both sides by } -.0036 \\ h = 15,000 \text{ feet.} & \end{array}$$

Note that even without the equation, you could estimate the answers by using what you know about linear functions to extend the table. You know that each time h increases by 5,000, T must decrease by 18° :

h	T	
0	60	
5,000	42	
10,000	24	
15,000	6	
20,000	-12	
25,000	-30	etc.

The solution for part (c) is thus confirmed, since (15,000, 6) is in the table. You can be confident about the solution to part (b) as well, since 13,000 is between 10,000 and 15,000, while the computed solution, 13.2, is between 24 and 6.

UNDERSTANDING AND MEMORY IN MATHEMATICS

Most students rely too much on memory in their study and use of mathematics. Competence in mathematics is not to any great extent a matter of remembering things. It is true that a child in the early grades is encouraged to memorize the multiplication tables. But he or she is also taught that multiplication may be thought of as repeated addition. The memorization may help the child multiply more quickly; but when memory fails, the understanding that, for example, $5 \times 9 = 9 + 9 + 9 + 9 + 9$ will help the child out of difficulty.

Perhaps such early memorization leads to a habit of memorizing in high school and college math courses. Having a needed formula memorized is certainly convenient. But understanding the idea behind the formula and knowing how the formula was constructed are critical for success in mathematics, especially as you progress beyond arithmetic and elementary algebra. In contemporary college math courses, conceptual understanding and the ability to apply those concepts are far more important than rote memorization. Many instructors supply necessary formulas or even allow their students to bring in formula sheets to written examinations.

An illustration is provided by the basic trigonometric identities. Students always seem to remember the formula $\sin^2 \theta \cos^2 \theta = 1$, but they have difficulty retaining similar formulas that relate the tangent and secant of an angle or its cotangent and cosecant. Actually, you don't have to memorize any of the identities if you understand the meanings of the trigonometric functions of angles. For example, to find the identity linking the tangent and secant of an angle, you need only draw a right triangle like that shown in Figure 17.7. Then, since $x^2 + y^2 = r^2$ (by the Pythagorean theorem), we have

$$\frac{x^2}{x^2} + \frac{y^2}{x^2} = \frac{r^2}{x^2}$$

Because $\tan \theta = y/x$ and $\sec \theta = r/x$, this becomes

$$1 + \tan^2 \theta = \sec^2 \theta$$

It's that simple, when you understand.

Of course, you do need skill to perform certain mathematical operations. But much of that skill comes from knowing what you are doing—from understanding what the operations are, what they produce, and what they

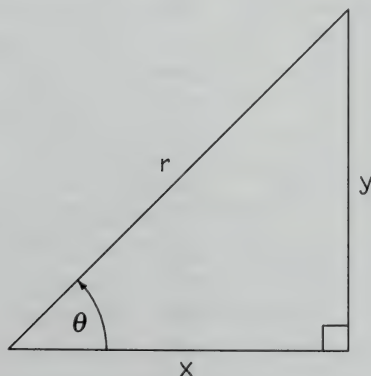


FIGURE 17.7 Right Triangle for Use in Deriving Trigonometric Identities

mean. The remainder comes from practice, from doing those sometimes dreary but nonetheless useful routine problems. And you do need to memorize some facts in mathematics, as in every other subject. The proper mix of skill, memorization, and understanding, however, is one that leans heavily toward understanding.

Look at it this way: Most likely, you are studying mathematics so that later you will be able to apply it in science, engineering, business, economics, the social sciences, teaching, or some other area. You should know, then, that the usefulness of mathematics in these areas arises primarily from the application of its ideas, rather than from its formulas or processes (although all three have their uses). Memorizing and applying math formulas without understanding them is like repeating Russian words without knowing what they mean. You're not speaking the language: You're only imitating its noises.

SUMMARY

What makes studying mathematics so different from studying other subjects?

Mathematics is one of the few subjects that is developed cumulatively through your school years, from grade school to college. What you didn't master years ago can keep you from progressing now.

What can I do if my background is weak?

You have two solutions: First, you can attack each difficulty as you discover it. Second, you can diagnose your background to find your weak areas in advance. Then beef up those areas with self-help books.

How should note taking in math class differ from note taking in other classes?

Math notes should be taken sparingly—covering main ideas and clarifying remarks only—so that you can concentrate on the instructor's reasoning. If the lecture follows the book fairly closely, try taking notes in the book, close to the concepts or processes that they clarify.

How should I read my math textbook?

Always read mathematics with great care, to make sure you extract the exact meaning of its precisely defined terms. Write out all the examples and other computations along with the author as you read. Clear up any confusion when it arises, before you read on. Finally, do the problems only when sure you understand what you've read.

How should I use my calculator?

Be sure you know how your calculator works. Keep your instructional manual handy and refer to it often. Remember that your calculator is a tool, not a substitute for understanding. When using your calculator to solve problems, estimate your solution first to detect errors in data entry or manipulation.

Are there any tips for preparing for math exams?

Be sure to keep up with your assignments throughout the term. When exam time rolls around, start studying early so you'll have plenty of time to correct any problems you encounter during your review. And use 3×5 cards to make sure you have mastered all the important principles, processes, and formulas.

What's the plan of attack for a standard math problem?

First, analyze the problem. Sort out the given information, draw a diagram, and decide how you're going to find what is required. Having completed this analysis, compute the answer. Once you have an answer, check to make sure it is *the* answer.

How do I attack non-standard math problems?

Begin them in much the same way you'd begin standard problems, by sorting the information and drawing a diagram. Organizing the given data into a table and looking for patterns can often provide entry into the problem. Then try to find a link with a problem you've already solved or with a simpler problem. Restating the problem could help, as might working backward from what is required to what you are given. Manipulating the diagram could also show you a path to the solution.

Isn't memory important in studying math?

Memorizing should be done for convenience; it is not a necessity. It is far better to base your study of mathematics on an understanding of the concepts that lie behind the processes and formulas. Then, if your memory fails, you'll still be able to solve the problems.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three phrases listed below each sentence.

1. The objective of problem solving is to train students to _____.
find the right answers memorize formulas think conceptually
2. To benefit from working with a study partner, you must be set to _____.
let your partner take over be an active participant
divide the work equally
3. In using computers or calculators, you _____.
no longer need to know how to approach the problem
can depend on software to solve problems
still must estimate the answers to problems

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|-----------------------------|---|
| _____ 1. Checking | a. Involves separating and listing the problem information |
| _____ 2. Mathematical terms | b. Are defined precisely to convey exact meanings |
| _____ 3. Diagrams | c. Can reveal errors in analysis and computation |
| _____ 4. Sorting | d. Is a firm basis for progressing through the study of mathematics |
| _____ 5. Understanding | e. Can reveal relationships in problems |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. It is best to wait until the end of the semester to strengthen weak spots in your background.
- _____ 2. Mathematical terms are designed precisely to convey meanings.
- _____ 3. You can use your calculator in the analysis stage of problem solving.
- _____ 4. Doing a problem backward can sometimes help your analysis.
- _____ 5. You should memorize all formulas you don't understand.

- _____ 6. The best way to study for an examination is to keep up with your daily work.

Multiple choice. Choose the word or phrase that completes each following sentence most accurately, and circle the letter that precedes it.

1. You should keep your old mathematics textbooks on hand for
 - a. learning.
 - b. reviewing.
 - c. copying.
 - d. safekeeping.
2. A complicated problem can sometimes be analyzed by substituting simpler
 - a. equations.
 - b. requirements.
 - c. arithmetic.
 - d. numbers.
3. Problem solving is basically a matter of analysis and
 - a. troubleshooting.
 - b. recognition.
 - c. visualization.
 - d. computation.
4. A weak math background can be strengthened with
 - a. workbooks and programmed materials.
 - b. speed-reading and sleep-teaching.
 - c. spot reviewing and self-diagnosis.
 - d. thorough rereading of basic texts.
5. The most important part of your study of mathematics is
 - a. reading.
 - b. formulas.
 - c. note taking.
 - d. understanding.
6. Most students who study math rely too heavily on their
 - a. memory.
 - b. textbooks.
 - c. calculators.
 - d. emotions.

Short answer. Supply a brief answer for each of the following items.

1. Explain the “continuous” nature of mathematical study.
2. How can 3×5 cards be used in studying math?
3. What is your problem-solving tool kit?
4. Explain the role of memorization in studying math.

THE WORD HISTORY SYSTEM

pecuniary pe-cu'-ni-ar'-y *adj.* 1. Of or relating to money. 2. Requiring payment of money.

Pecuniary *from the barter of primitive herdsmen*



In the nomadic period of Indo-European civilization, before money in precious metal or other compact symbols was thought of, a man's wealth was reckoned in flocks and herds. Latin *pecus* means “cattle,” and the derivative *pecunis* meant, originally, “property in cattle.” As civilization advanced and wealth was represented by many things other than cattle, the old word was kept for the broader new meaning. When money was invented and adopted as a measurement of wealth, the word *pecunia* took on the new meaning “money.” Derived from this was the adjective *pecuniarius*, “relating to or consisting of money,” from which we made English *pecuniary*.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

Winston Churchill is the *prototypical* example of English dry wit and humor, and he spared no one. In a conversation with Churchill at his family home, Blenheim Palace, Lady Nancy Astor, Britain's first woman member of Parliament, was *espousing* women's rights to an *ungrateful* ear. Churchill repeatedly opposed her on one issue after another until, finally *exasperated*, Lady Astor threatened, "Winston, if I were married to you, I'd put poison in your coffee!"

Churchill calmly responded, "And if you were my wife, I'd drink it."

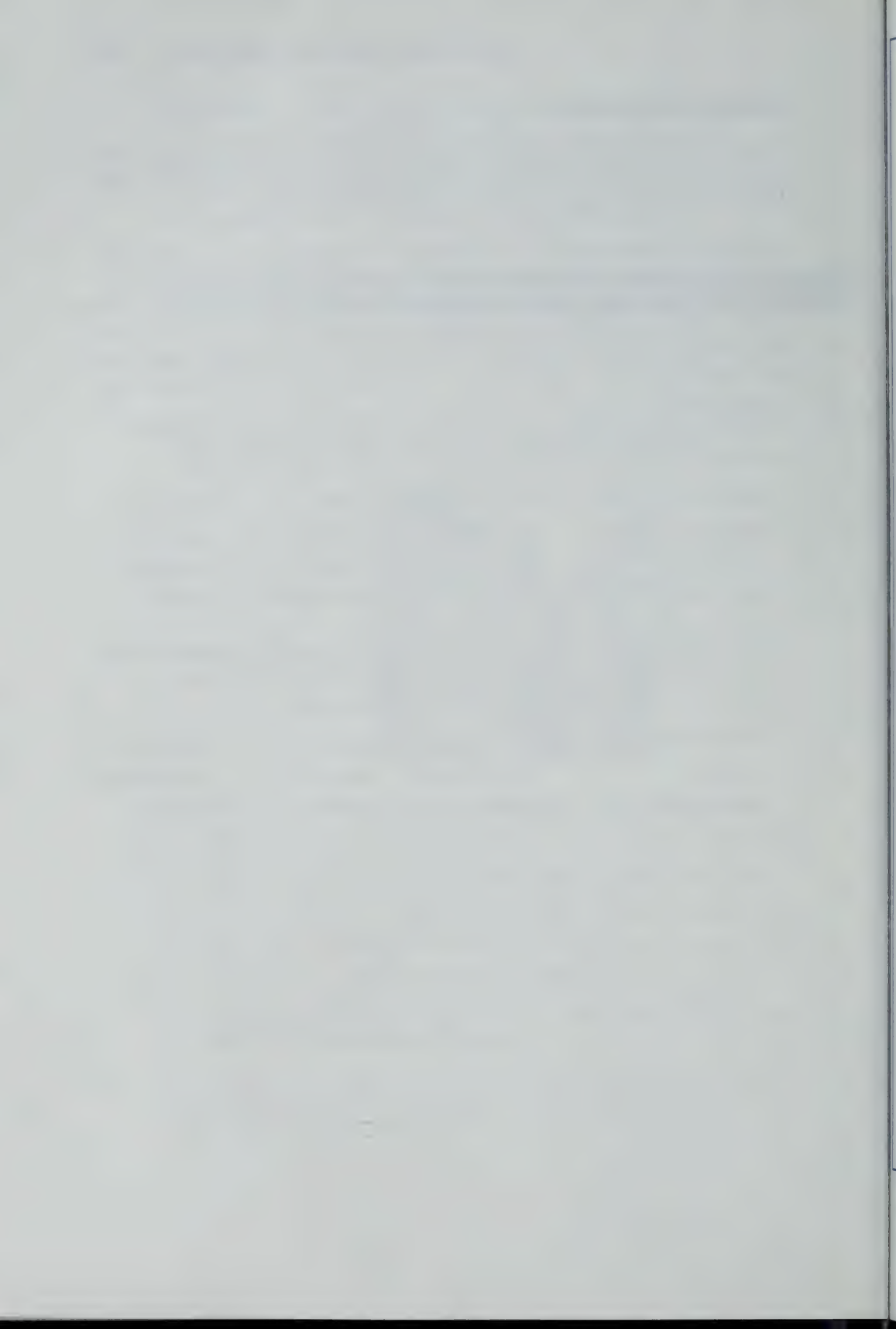
—Winston Churchill (1874–1963), British statesman and prime minister

- | | | | |
|----------------------------------|-----------|-------------|-------------|
| 1. <i>prototypical</i> example | obvious | classic | prominent |
| 2. <i>espousing</i> . . . rights | praising | describing | supporting |
| 3. <i>ungrateful</i> ear | thankless | irritable | insensitive |
| 4. finally <i>exasperated</i> | annoyed | intimidated | excited |

Business more than any other occupation is a *continual* dealing with the future; it is a continual *calculation*, and *instinctive* exercise in foresight.

—Henry R. Luce (1898–1967), American editor and publisher

- | | | | |
|--------------------------------|--------------|-------------|-------------|
| 5. <i>continual</i> dealing | constant | crucial | cumbersome |
| 6. <i>calculation</i> | accumulation | cultivation | computation |
| 7. <i>instinctive</i> exercise | automatic | ambitious | inspiring |



LEARNING WITH THE COMPUTER

I had rather dream of the future than read a history of the past.

—THOMAS JEFFERSON (1743–1826), THIRD PRESIDENT OF THE UNITED STATES

Does the thought of sitting down at a computer terminal leave you with high-tech anxiety? If so, you might be surprised to discover that you can learn many of the basics of computing within a few hours. Computers are not just easy to learn; they are useful. They can help you research and write papers, study, plan a schedule, and save time. This chapter covers some basic information about computing. It discusses:

- Debunking myths about computers
- Identifying your school's computer resources
- Using your computer as an aid to becoming a better student
- Using the computer in the library
- Using the Internet

LEARNING WITH THE COMPUTER

Debunking
Myths About
Computers

Identifying
Your School's
Computer
Resources

Using Your
Computer as an
Aid to Becoming
a Better Student

Learning Word
Processing

Using Word Processing
as a Study Aid

Learning Other
Kinds of Software

Learning
Spreadsheets

Using Computers
in the Library

Learning
Databases

Using the
Internet

DEBUNKING MYTHS ABOUT COMPUTERS

If you have little or no firsthand computer experience, you may be anxious about using a computer. You may believe some of the following myths.

1. *Everyone else knows about computers already. I'll just seem stupid.* Most people are familiar with only a few computer applications, and they were just as apprehensive as you about facing a computer for the first time. It's natural to be anxious about new learning situations. A healthy amount of anxiety makes people mentally alert for new learning situations. Combat overanxious feelings by remembering a successful, though stressful, learning experience of your own. Recall how your initial misgivings became feelings of interest and relief once you felt in control of the situation. After learning the basics of computing, you'll wonder why you were anxious at all. In addition, remember that you can use what you already know in new applications; for example, "cut" and "paste" functions are basically the same in all applications.

2. *I'm not good with machines. I could damage the equipment or lose my data.* Computers are no more fragile than your radio. Unless you pick up the computer and throw it against the wall or spill something on it, you're not likely to damage it. A computer will not be harmed if you accidentally press the wrong keys on the keyboard. Moreover, the computer software will tell you which key to press to perform a particular function, and it double-checks whether you *really* want to delete material you've instructed it to delete. One key rule to remember, though, is to create backups of all your files.

3. *I'll have to take a computer programming course to understand computers.* Very few people need to know how to program a computer, and you don't need to know how to program one in order to use one. The word *program* refers to the internal commands that the computer reads every time it performs a task, and *programming* refers to the writing of those commands into the computer's software. *Software* refers to the instructions, written onto a disk or tape, that direct the computer to perform a particular operation. To use the computer for word processing, spreadsheet accounting, or database management, you don't need to know anything about how the software you are using was programmed, any more than you need to know how a book was written before you start reading it.

4. *I'll need extensive skills before I'll be able to use the computer.* Seven or eight basic commands are usually all you'll need to begin using word-processing software. The same is true of learning to use a spreadsheet or working with a database management program. Many students can begin

to use such programs within two or three hours. You'll find that after you've learned the introductory commands, you'll easily be able to learn more.

5. *I shouldn't try to learn computing until I can afford to own a computer.* If you buy a computer before you learn much about computers, you may end up with equipment not well suited to your needs. There's nothing wrong with buying your own computer eventually. But if you're still learning about computers, it's best to gain some experience before you spend your money. Use a friend's computer or learn in a workshop or computer lab. Computers in college labs are set up and ready to go, and the lab operators should be able to answer your questions.

IDENTIFYING YOUR SCHOOL'S COMPUTER RESOURCES

Because the use of computers will be a valuable learning and organizing tool for you during your college career, if a computer course is required for graduation, you should take it at the first opportunity—your first semester if possible. Not only will you build your computer skills, you will also learn about the valuable computer resources available on campus. If such a course is not required, you may want to take a course or a workshop for specific computer applications such as word processing, spreadsheets, or database management.

Take the initiative the first week of school, or even during campus orientation before school begins, to find out about computer facilities. If you are already well into the semester, do it now! Don't be shy about asking questions: Where are computers located that students can use? What kind are they, and what do I need to do in order to use them? If I'm not familiar with computers, what help is available?

In addition you need to find out the answers to the following questions:

1. *How many computers or computer terminals are available?* Depending on the facilities of your campus computer lab, you will have access to computers, computer terminals, or both. A *computer* is any electronic device that can accept, process, store, display, and print information or data. Apple's iMac or Dell, Gateway, or Compaq PCs are several well-known microcomputers. The term *computer* can also apply to powerful mainframes, capable of supporting many computer terminals. A *computer terminal* normally consists only of a keyboard and a screen. You input data with the keyboard and

see the data displayed on the screen. Unlike a microcomputer, a computer terminal doesn't process, store, or output information. Those tasks are performed by the mainframe to which the terminal is connected.

2. *What types of computers and computer software are available?* You are likely to have access to a number of different computers. Initially, you may feel most comfortable by picking one type and learning on it. As you become experienced, you can experiment with others. The same applies to software. At the outset, it's usually a good idea to master only one type of software. Once you become comfortable with that type, you can learn another. If possible, start with software that is widely used. More people will be able to help you if you have questions about well-known software. In addition, such software is often the most flexible and is more likely to be compatible with several types of computers. Microsoft Word and WordPerfect, two examples of popular word-processing software, come in versions for both PCs and Apple computers.

3. *How many and what kinds of printers are available?* A printer is the device that gives you a printed version (the hard copy) of your work. Although several kinds of printers are available, you are most likely to encounter printers using either lasers or ink jets. The highest quality of print comes from a laser printer. Laser printers produce letter-quality results—the printed characters are good enough for professional correspondence and other documents. Ink jet printers produce characters by shooting ink through tiny holes. Most ink jet printers generate quite readable print, and some can produce letter-quality print. In addition, ink jet printers are relatively inexpensive to buy and operate, and the computer lab is most likely to have more of them than other, more expensive printers. They are excellent for printing drafts and final copy for college papers and projects.

4. *What are the general rules for using the computer lab?* Find out first whether the lab uses personal computers or terminals. If it uses PCs, you may be required to furnish your own disks. If the lab uses terminals, you will probably be assigned a password—a word or series of nonsense characters—that you use to log on to the mainframe computer. Passwords protect the material in your files from being used by anyone else. Find out whether you need to sign up in advance to use a computer or a terminal. This may be necessary, especially during periods of heavy use such as the end of the term, when many students are completing term projects and research papers.

You may also want to determine whether the Internet and electronic mail are available to students through your school, and to learn how to use the library computer catalog and databases as soon as possible.

USING YOUR COMPUTER AS AN AID TO BECOMING A BETTER STUDENT

The kind of work a student undertakes in college makes the use of the computer invaluable. When you take courses in humanities or social sciences, you will benefit from word processing. If you study math, any of the sciences, or a technical field, learning how to store and retrieve information in a database will improve your ability to generate useful reports. You will find spreadsheets invaluable in business, economics, and accounting courses. In addition, many fields of study make use of educational software to supplement or reinforce learning. Finally, the Internet and the World Wide Web will give you another way to communicate with your instructors and fellow students and allow you to access a wealth of information.

Learning Word Processing

If you've ever labored over several drafts of a research paper, writing and rewriting through piles of paper, you will greatly appreciate word processing. Word processing is as simple as typing: You type on the keyboard, and your text is displayed on the screen. A simple command stores that information, probably on a floppy disk that you have inserted into the computer or on the hard drive of your personal computer. You can print the text at any time or retrieve it for further work.

If you don't know the keyboard, typing is a skill you need to learn. The less you have to think about finding letters, the more you can think about what you are writing. Don't be intimidated by the keyboard; you will only get better with practice, and mistakes are easy to fix. The computer lab may have a typing tutorial program to help you get started.

Once you get comfortable using the keyboard and a few basic editing functions, you will find yourself thinking and composing at the computer, rather than using it just to type. Writing is a process. The final product doesn't magically flow from your pen or keyboard. Many times you need to actually see something in writing to know what you think of it or to develop an idea further. Most students say composing on computers is more fun. The use of the keyboard allows you an easy way to brainstorm.

Once you've input the text, you can use a few simple commands to edit it quickly and efficiently. You can move a word, a line, or a large block of text from one place in the document to another. You can delete text from, or add text to, any place you like. In short, you can edit and rewrite with a few keystrokes, instead of retyping the entire paper. Of course, the storage system on the computer allows you to keep all your drafts. You can do several versions and keep the best.

Other features of word-processing software include spelling checkers, an electronic thesaurus, and style checkers. A spelling checker scans your manuscript, highlights the misspelled words it finds, and allows you to correct them. An electronic thesaurus provides onscreen lists of synonyms and antonyms, helpful if you're stuck trying to think of a word. Style checkers point out awkward or grammatically incorrect language and punctuation errors. These features don't guarantee you'll write a great paper, but they'll help you check and edit your work, thus giving you more time for improving the quality of your work. In addition, the appearance of your work is enhanced by using a quality printer.

You will want to remember some basic computer common sense. Get into the habit of saving your work about every five minutes or so. When you save it the first time, you will be asked to name your document. Choose a name that identifies what is on the document. If you are saving to a disk, carefully label what is on that disk, or you'll find yourself spending hours going through disks looking for the document.

Keep in mind that a disk is magnetic. Magnets will erase the contents of your disk. Although disks are sturdy, use caution when transporting them from place to place. Avoid moisture and temperature extremes (don't leave disks on your dashboard, for instance).

Using Word Processing as a Study Aid

Once you can think and compose at the computer rather than just using it to type finished products, you can expand the scope of your study skills. In addition to generating, composing, and typing the final draft of papers and assignments, you will find that you can also use word-processing programs to study more efficiently.

Kinesthetic and visual learners are particularly helped by using the computer. Kinesthetic learners prefer and actually learn better when they touch and are physically involved in what they are studying. They find that when they physically do something, they understand it and remember it better. Using the computer gets you physically involved and does more than just studying your notes would do. Visual learners need to see what they are learning, and often the appearance of the printed product will stay in memory longer than their own written notes.

The Cornell System and the Questions-in-the-Margin System use the principle of selectivity. When preparing for final exams or a major test, you may want to carry selectivity one step further by taking your Cornell notes from class and the questions-in-the-margin notes in your text and making study guides combining the important ideas from both. Summarizing and selecting what is important to include in your guide is a very powerful part

of the learning and review process. You may also want to use your computer to keep a list of vocabulary words in each course that you will need to know for tests.

One of the most effective ways of using your computer to learn is to compose practice tests. Use selectivity to narrow the amount of material to a manageable amount. After you have put the material to be learned into test form, the actual test will be easier because you have thought of the information in a test format rather than memorizing facts. And because you have already practiced taking your test, maybe even more than once, you reduce test anxiety for the real thing.

Learning Other Kinds of Software

In addition to using word processing as a way to learn on your computer, you may also use tutorial software, problem-solving software, and simulations. Many textbooks are sold with software bound inside. Or you may ask your professor if such software is available for your course. In the typical program, a problem, accompanying question, and possible answers are simultaneously displayed on the screen. The software allows you to choose the correct answer and immediately receive feedback about your response. Because the questions are usually matching or multiple-choice questions, this kind of software is most useful for review of basic concepts in mathematics, the sciences, and languages. For instance, you could use a chemistry program to review the elements in the Periodic Table. A mathematics program could display a problem and ask you to select the correct solution. Using such programs requires only simple word-processing skills.

Tutorial and Problem-Solving Software Tutorial programs, such as those used for learning foreign languages, are similar; however, they are constructed so that all necessary instructions appear on the screen. No other supplemental instructions are required. You may want to use tutorial programs to learn typing or other computer skills. Problem-solving software can help teach problem-solving skills in the context of a particular discipline such as math, the sciences, or social sciences. Problem-solving software typically asks you to recognize a problem, formulate a hypothesis or possible solution to that problem, gather information, test potential solutions, and arrive at a viable solution.

Simulations The popular computer-based flight simulators, available at both computer stores and toy stores, are an entertaining example of an invaluable category of computer programs: simulation software. Simula-

tion software is a program that uses data to model a real-life event. The software allows you to change certain conditions so that you can test various hypotheses and predict different outcomes. Like mathematics software, simulation software provides immediate feedback about situations that would take days or weeks to calculate using conventional methods. It also teaches and reinforces principles about complex phenomena that might otherwise exist only as abstractions. A simulation program could allow you to predict and then simulate certain chemical reactions, and then it would display the results of your simulation either in text or in graphics. Other types of simulation software can help you to model economic and business scenarios or to simulate genetics and breeding programs.

Educational Games Educational games teach strategizing, logical skills, and concept skills. Depending on the game, you can compete against yourself, the computer, or a friend. Playing an educational game can lower your anxiety about using the computer in the first place, or it can sharpen your skills and relax you during a particularly intense studying session. Keep in mind that the level at which you learn is related to the demands of the game. Games in which you shoot aliens are not too likely to increase your problem-solving skills.

Additional Useful Applications Other kinds of applications can help you in many subjects you'll study in college. Packages such as PhotoShop, for example, enable visual artists to render their ideas and images on the computer. And planning, budgeting, and project-tracking applications can be invaluable to business majors.

Learning Spreadsheets

An electronic spreadsheet takes the place of the conventional spreadsheet used by accountants and financial analysts. Like conventional spreadsheets, electronic spreadsheets are composed of horizontal rows and vertical columns that intersect and allow you to insert data in the cells. You can enter numbers, words, or formulas into each cell, store what you've entered, and then manipulate the stored information. The software is programmed so that you can quickly and easily perform a variety of calculations with the data. The functions you are likely to encounter if you work with a spreadsheet are similar to those used in word processing. You can see how becoming proficient with one type of software helps you with another type.

Spreadsheets are used in business, economics, and accounting courses in which students work with case studies, problem sets, and statistical models. You can make personal use of spreadsheets as well. Spreadsheets simplify managing a personal budget or keeping financial records for an organization or social club. They also allow for quick and efficient personal tax planning.

One of the best things you can do as a student is to set up your course of study on a spreadsheet. List all the courses you will need to graduate in categories as listed in your catalog. As you take a course, enter the grade you receive and keep track of your average for a class or chart your GPA.

Learning Databases

You've probably dialed Directory Assistance, asked for someone's phone number, and been given it by an electronic recording. This was accomplished by means of a database management program. A database management program allows you to enter data into a database (the place where it is stored) and retrieve it quickly and easily. The cross-reference filing in the system allows you to retrieve and manipulate the information in a number of ways.

Think of a database as you would think of a conventional filing cabinet. The item that holds the largest group of information in the filing cabinet is the file drawer. Each drawer is capable of holding several small file folders. Each folder holds numerous pieces of information, such as letters and numbers. In an electronic database, the file drawer is called the *file*; the folders it holds are called *records*; the pieces of information contained in the records are called *fields*. Individual numbers, letters, and symbols, called *characters*, are inserted into the fields. Although spreadsheets and database management can make accounting, bibliographies, and statistical and other tasks quick and easy, the library and the Internet are the most likely places you will be using databases.

Using Computers in the Library

The card catalog is an organized inventory of the library's holding. Most colleges now have this catalog computerized, or online. Online or computer catalogs vary greatly from library to library. Most are user-friendly and have "help" screens. The online catalogs are searched from computer terminals centrally located in the library. You may be able to access the catalog through the academic computing system or remotely with a microcomputer and modem.

Most systems offer a flexible approach to searching for materials. Items may be located by author, title, author/title combination, Library of Congress subject headings, or keyterms. Also, you can usually limit search results by language, publication date, publication format, and other simple constraints.

You will want to take time at the beginning of the semester to learn how to operate the computer catalog so that when you need it, you won't have to stop and learn. Sometimes there is a library orientation. There will probably be handouts and instructions printed near the computer, or you can ask the librarians to help you. Do not hesitate to ask. You are certainly not the only student who needs help.

In addition to online catalogs, many libraries will have various electronic databases such as CD-ROM. Specialized databases should be available in most subjects across the curriculum. Some of the better-known databases on CD-ROM are ABI/inform; Business NewsBank PLUS; ERIC; America: History and Life on Disc; Historical Abstracts on Disc; Index to American Periodicals; MLA International Bibliography, Contemporary Authors on CD-ROM; The Music Index on CD-ROM; Comprehensive MEDLINE/EBSCO; HEALTH Planning and Administration; PsycLIT; Dissertation Abstracts Ondisc; and numerous U.S. government publications such as the U.S. Census. Ask your major instructors or librarian which is the best database to use for each subject you need to research.

Larger libraries will have expanded academic indexes. Instead of using print indexes such as *Readers Guide*, you may be able to access this information on a computer database. One such index, Infotrac, indexes and abstracts approximately 1,600 scholarly and general-interest periodicals covering the humanities, communications studies, the social sciences, the arts, science, and technology. Some articles are available in full text in this electronic information resource. Again, it is important for you to know what computer services the library offers and how to use them. They will save you valuable time in your search for information.

Using the Internet

In addition to the electronic resources in the library, you will have literally hundreds of thousands of resources available to you on the Internet. The Internet is more than a medium for e-mail; it is a repository for information from all over the world. Ask whether access to the Internet is available to students at your school and how you can subscribe to it. In fact, some professors may require that you have an e-mail account.

Many colleges and universities have their own home pages on the World Wide Web. On these pages you will find things like the school catalog,

course offerings, campus services, and the library online catalog. You should also be able to keep up to date with campus events. Tools such as Usenet News or Revised Listserv organize discussion groups ranging from very specific to very general and can be local or worldwide. Individuals and institutions also have collections of papers or databases available on the Internet. Many periodicals such as *USA Today*, the *New York Times*, the *Los Angeles Times*, and *Forbes* are available on the Internet. In addition, classical works of literature such as Shakespeare, the Bible, and *Moby Dick* are available. You can find audio documents as well as video. In short, the Internet is a virtual reference desk on almost any subject and all its information can be downloaded to your computer.

If you are unable to get on your institution's Internet line, you may want to subscribe to a commercial information service such as CompuServe, America Online, or Prodigy. These perform many of the same functions as the Internet services and are as easy to access.

Whichever system you choose, be aware that some online information may be more detailed than you need. Be selective. In addition, be aware that not all information on the Internet is of the same quality. Some questions you should ask yourself about online information are the following: How can I tell if the information is at the right level (how do I select)? How can I tell if the information is accurate? How do I know when I've found enough information, or not enough? When should I expand or contract my search? The important thing is to become a critical user of online information.

SUMMARY

What are some myths about computers?

(1) Everyone else already knows how to use a computer. (2) I may damage the equipment. (3) I need to know computer programming to use a computer. (4) I'll need extensive training. (5) I really have to own a computer.

What questions should I ask as I check my college's computer facilities?

(1) How many computer terminals are available? (2) What types of computers and computer software are available? (3) How many and what type of printers are available? (4) What are the general rules for using the computer labs? (5) Do I need to sign up in advance to use the facilities?

How is word processing helpful to students?

Word processing makes it easier to write and edit once the material is input. Features such as spelling checkers, thesauruses, and style checkers are available.

What common-sense basics apply to using a computer?

Save files often, file and label logically, handle disks with care.

Why are computers beneficial to kinesthetic and visual learners?

Kinesthetic learners need to be physically involved in what they are learning, and visual learners need to see the material. The computer allows for both.

How can I use the computer to learn?

By making study guides and by processing notes from lectures and textbooks, vocabulary words, and practice tests.

What types of learning software are available?

Tutorial, problem-solving, and simulation software aid in learning. Educational games may also help.

What do spreadsheet and database management programs do?

Spreadsheet accounting software allows you to enter, store, retrieve, and manipulate data for accounting and other purposes. You can perform a variety of calculations with speed and accuracy. Database management software allows you to retrieve and manipulate data that have been entered into a database.

What are some uses of the computer in the library?

You will use the online card catalog and databases such as those on CD-ROM or academic indexes such as Infotrac.

What are two uses of the Internet?

The Internet can be used for electronic mail (e-mail) and for reference and research.

HAVE YOU MISSED SOMETHING?

Sentence completion. Complete the following sentences with one of the three words or phrases listed below each sentence.

1. One of the most important uses of a computer in college is for _____.
typing term papers storing lecture notes keeping you organized
2. The word processor's main function is to _____.
indicate misspelled words save you time and energy
offer a list of synonyms

3. One skill that a computer user doesn't need to know is _____.
 typing programming filing

Matching. In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|------------------------------|---|
| _____ 1. the Internet | a. Programmed instruction |
| _____ 2. Infotrack | b. Composed of horizontal and vertical columns that intersect and allow you to insert data at the cells |
| _____ 3. Spreadsheets | c. Expanded academic index that indexes and abstracts over 1,600 periodicals |
| _____ 4. Databases | d. Software programmed for specific learning situations |
| _____ 5. Educational games | e. Electronic medium for personal communication as well as a repository for information from all over the world |
| _____ 6. Simulation software | f. Holds information arranged for easy access |
| _____ 7. Tutorial software | g. Uses data to model a real-life event |

True-false. Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Learning to program a computer and learning to use different kinds of software are basically the same.
- _____ 2. A college student will probably use a computer only to type papers and assignments.
- _____ 3. One advantage that word processing offers over typing is the ease of editing.
- _____ 4. There is no need to learn how to use a computer; it will be outdated before you can really use it.
- _____ 5. Computers can help visual and audio learners learn better.
- _____ 6. You really need to be able to type well in order to use a computer.
- _____ 7. Creating practice tests on the computer may actually reduce test anxiety.
- _____ 8. Most word-processing programs are simple enough that you can learn one while you are typing your first paper.

- _____ 9. You will probably have to get on the Internet to use your library's online card catalog.
- _____ 10. The printed version of a paper is usually referred to as a "hard copy."

Multiple choice. Choose the word or phrase that completes each of the following sentences most accurately and circle the letter that precedes it.

1. Using a word-processing program is likely to increase your
 - a. productivity.
 - b. alternatives.
 - c. preparation.
 - d. labor.
2. Probably the biggest advantage to becoming computer literate is that you
 - a. understand programming languages.
 - b. can take advantage of new ways of learning.
 - c. know complex terminology.
 - d. know which computer to buy for yourself.
3. Most people who use computers are familiar only with computer
 - a. programming.
 - b. applications.
 - c. terminology.
 - d. engineering.
4. Database management programs use
 - a. files.
 - b. records.
 - c. fields.
 - d. all the above.
5. In computing, *program* refers to
 - a. an electronic connection.
 - b. internal commands the computer reads.
 - c. a system that simplifies accounting.
 - d. none of the above.
6. Word processing is nearly the same as
 - a. editing.
 - b. arithmetic.
 - c. illustrating.
 - d. typing.

Short answer. Supply a brief answer for each of the following items.

1. Name three strategies to enhance your learning with the computer.
2. Name three commonsense basics to word processing.
3. List the computer labs available on your campus. Include the hours available.
4. What must you do to use the computers in each lab?
5. What word-processing programs are available to use? Which will you try?
6. Name three people who know how to use this program.
7. Make a practice test for the next test you know you will have.
8. Ask in each course you are taking what software is available to supplement your learning with either drill and practice, tutorial, simulation, problem solving, or educational games.

Course

Software

9. Use the online computer catalog in your library to answer the following questions.

What command do you type to perform an author search? _____

What command do you type to perform a title search? _____

What command do you type to perform a subject search? _____

What command do you type if you know only part of the title? _____

How many entries does the catalog have for *learning styles*? _____

What are the titles of three books by Mark Twain?

Name three books in your library about using the Internet.

10. What databases are available in your library? Name three.

11. Considering your major, which databases are you likely to use most often? (You may need to ask a professor in your major.)

12. How can a student on your campus get on the Internet?

13. Name three people on your campus who use the Internet and who might help you if you ask.

14. Use the Internet to find information about your campus. List four things you found out.

Practice using the Internet

1. Perform a search for a newsgroup that interests you. Read at least five messages on different topics, and report on each in a few sentences.
2. Use an Internet browser to find and report on:
 - (a) a part-time student job listing
 - (b) a career you are interested in pursuing
3. Explore a magazine's or newspaper's web site. Write a paragraph about what you found most interesting. Be sure to include the URL in your response.

THE WORD HISTORY SYSTEM

tally tal'-ly *n.* 1. A reckoning or score. 2. A mark used in recording a number of acts or objects.

Tally: *a reminder of the early method of counting*



Tally goes back to the time when things were commonly counted by cutting notches in a stick of wood. The word was borrowed in Middle English as *taille*, from Old French *taille*, "a cutting." It was formerly customary for traders to have two sticks and to mark with notches on each the number or quantity of goods delivered, the seller keeping one stick and the purchaser the other. When such records came to be kept on paper, the same word was used for them; and it now means almost any kind of count or score.

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WORDS IN CONTEXT

Directions: From the three choices beside each numbered item, select the one that most nearly expresses the meaning of the italicized word in the quote. Make a light check mark (✓) next to your choice.

The danger of the past was that men became slaves. The danger of the future is that men may become *robots*.

—Erich Fromm (1900–1980), American psychoanalyst

1. become *robots* tyrants mutants machines

The art of *prophecy* is very difficult, especially with respect to the future.

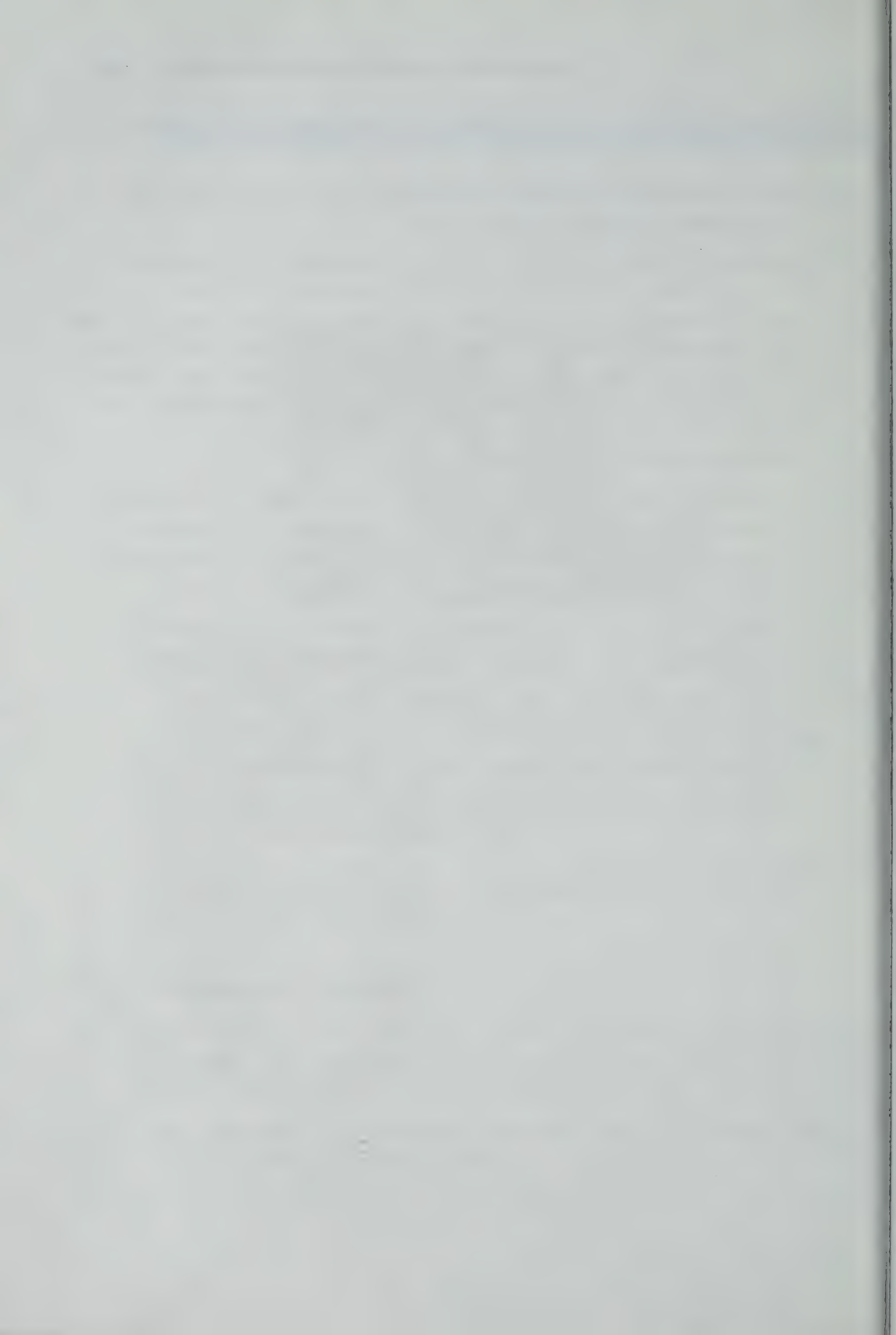
—Mark Twain (1835–1910), American author

2. art of *prophecy* gambling prediction decisions

We must learn how to handle words *effectively*; but at the same time we must preserve and, if necessary, *intensify* our ability to look at the world directly and not through that half *opaque* medium of concepts, which *distorts* every given fact into the all too familiar likeness of some *generic* label or explanatory *abstraction*.

—Aldous Huxley (1894–1963), British writer

- | | | | |
|-----------------------------------|--------------|--------------|--------------|
| 3. words <i>effectively</i> | with thought | with respect | with results |
| 4. <i>intensify</i> . . . ability | modify | increase | amplify |
| 5. <i>opaque</i> medium | cloudy | brilliant | transparent |
| 6. <i>distorts</i> . . . fact | twists | clarifies | leads |
| 7. <i>generic</i> label | biological | brand | general |
| 8. <i>abstraction</i> | fact | incident | theory |



Appendix: Answers ---

Chapter 1 Setting Goals

Have You Missed Something?

Sentence completion: 1. focused 2. destinations

Matching: 1. e 2. f 3. b 4. h 5. a 6. c 7. d 8. g

True-false: 1. F 2. F 3. T 4. F 5. T 6. F 7. T 8. F

9. F 10. T

Multiple choice: 1. c 2. d

Words in context: 1. perseverance 2. natural gift 3. high aptitude

4. vagrants 5. gorge 6. rewards

Chapter 2 Managing Your Time

Have You Missed Something?

Sentence completion: 1. time 2. habit

Matching: 1. g 2. f 3. d 4. b 5. h 6. c 7. a 8. e

True-false: 1. F 2. T 3. T 4. F 5. T 6. T

Multiple choice: 1. b 2. a 3. c 4. b 5. c 6. b 7. d

8. c

Words in context: 1. strength 2. sorrowfully 3. death 4. worth

5. inexplicable 6. associated 7. included

Chapter 3 Managing Stress

Have You Missed Something?

Sentence completion: 1. stress 2. failure

Matching: 1. b 2. f 3. e 4. c 5. a 6. d

True-false: 1. T 2. T 3. T 4. F 5. F 6. T

Multiple choice: 1. c 2. d 3. b 4. d 5. b 6. c 7. b

Words in context 1. stressed 2. gibberish 3. insinuations 4. untalkative
5. average people 6. nullified

Chapter 4 Concentrating and Focusing

Have You Missed Something?

Sentence completion: 1. broken 2. the library 3. self-discipline

Matching: 1. g 2. h 3. a 4. f 5. b 6. d 7. e 8. c

True-false: 1. T 2. F 3. T 4. F 5. F 6. F 7. T

Multiple choice: 1. a 2. d 3. c 4. a 5. b 6. c

Words in context: 1. corruptive 2. orderly 3. refinement 4. unappealing
5. despicable

Chapter 5 Forgetting and Remembering

Have You Missed Something?

Sentence completion: 1. middle 2. disliked

Matching: 1. c 2. h 3. g 4. e 5. a 6. b 7. d 8. f

True-false: 1. T 2. T 3. T 4. F 5. F

Multiple choice: 1. b 2. a 3. c 4. b 5. a

Words in context: 1. new ideas 2. reword 3. possessed 4. disasters

Chapter 6 Building a Permanent Vocabulary

Have You Missed Something?

Sentence completion: 1. success 2. context 3. synonyms

4. mental ability 5. memorable 6. silently

Matching: 1. b 2. c 3. g 4. f 5. a 6. d 7. e 8. h

9. j 10. i

True-false: 1. F 2. T 3. T 4. F 5. T 6. T

Multiple choice: 1. b 2. d 3. b 4. b 5. d 6. d

Words in context: 1. given new life 2. absolute 3. rewards

Chapter 7 Improving Your Reading Speed and Comprehension

Have You Missed Something?

Sentence completion: 1. magnets 2. information

Matching: 1. b 2. e 3. c 4. a 5. d 6. g 7. f

True-false: 1. T 2. T 3. T 4. T 5. T 6. T

Multiple choice: 1. a 2. c

Words in context: 1. nonfeeling 2. disdainful 3. component
4. irritating

Chapter 8 Understanding and Using Key Concepts

Have You Missed Something?

Sentence completion: 1. concentration

2. keep writing, then try to discover the pattern later

Matching: 1. c 2. e 3. b 4. f 5. d 6. a

True-false: 1. F 2. F 3. F 4. F 5. T 6. F 7. F 8. F

Multiple choice: 1. d 2. a 3. a 4. c 5. a

Words in context: 1. dictionary 2. unbeatable 3. stern

Chapter 9 Listening to Take Good Notes

Have You Missed Something?

Sentence completion: 1. absorbed 2. facts 3. sympathetic

Matching: 1. b 2. e 3. h 4. d 5. c 6. g 7. a 8. f

True-false: 1. T 2. F 3. F 4. T 5. T

Multiple choice: 1. c 2. d 3. d

Words in context: 1. pride 2. insincere 3. humbleness 4. awesome
5. obtains 6. respect 7. characteristic

Chapter 10 Taking Good Notes

Have You Missed Something?

Sentence completion: 1. minutes 2. forgetting

Matching: 1. d 2. c 3. f 4. b 5. g 6. e 7. a

True-false: 1. F 2. T 3. F 4. T 5. T 6. T

Multiple choice: 1. c 2. d 3. c

Words in context: 1. refinement 2. relieve 3. reasonable 4. dead-end

Chapter 11 Learning from Your Textbooks

Have You Missed Something?

Sentence completion: 1. cramming 2. sparingly 3. high

Matching: 1. d 2. f 3. g 4. e 5. c 6. a 7. b 8. h

True-false: 1. F 2. T 3. T 4. F 5. T

Multiple choice: 1. d 2. b 3. c 4. a

Words in context: 1. keenness 2. enemy 3. annoy 4. working class

Chapter 12 Noting What's Important in Readings

Have You Missed Something?

Sentence completion: 1. sentence 2. telegraphic 3. easy

Matching: 1. e 2. h 3. b 4. f 5. g 6. c 7. a 8. d

True-false: 1. F 2. T 3. T 4. T 5. F 6. T

Multiple choice: 1. b 2. b 3. d

Words in context: 1. major 2. unrelated 3. abundantly

4. favorable 5. trite phrase 6. filled

Chapter 13 Thinking Visually

Have You Missed Something?

Sentence completion: 1. brainpower 2. logical 3. oriented

Matching: 1. c 2. f 3. e 4. b 5. a 6. g 7. d

True-false: 1. T 2. T 3. T 4. T 5. F

Multiple choice: 1. b 2. d 3. a 4. c 5. a 6. d

Words in context: 1. impresario 2. delegate 3. briefness 4. abundantly

Chapter 14 Managing Test Anxiety

Have You Missed Something?

Sentence completion: 1. success 2. crisis 3. first

Matching: 1. f 2. c 3. g 4. e 5. b 6. a 7. d

True-false: 1. T 2. T 3. T 4. F 5. T 6. F 7. T

Multiple choice: 1. b 2. c 3. a 4. d 5. b 6. d

Words in context: 1. confirmation 2. unfathomable 3. lingo
4. identification 5. hidden 6. reasons 7. continuation 8. haughty
9. nasty

Chapter 15 Mastering Objective Tests

Have You Missed Something?

Sentence completion: 1. circled 2. correct

Matching: 1. g 2. d 3. h 4. a 5. e 6. c 7. f 8. b

True-false: 1. T 2. T 3. F 4. T 5. F 6. T 7. F

Multiple choice: 1. c 2. c 3. d 4. a 5. b 6. b

Words in context: 1. damaging force 2. unseen 3. decreased value
4. inordinate 5. peculiarities 6. cautious 7. outdated

Chapter 16 Tackling Essay Tests

Have You Missed Something?

Sentence completion: 1. reasoning 2. facts

Matching: 1. d 2. a 3. b 4. f 5. c 6. e

True-false: 1. F 2. T 3. T 4. F 5. T

Multiple choice: 1. a 2. d 3. b 4. d 5. a 6. d 7. a
8. a

Words in context: 1. obvious 2. provided 3. intrinsic 4. search
5. tact 6. evil 7. free enterprise 8. philanthropy

Chapter 17 Studying Mathematics

Have You Missed Something?

Sentence completion: 1. think conceptually 2. be an active participant
3. still must estimate the answers to problems

Matching: 1. c 2. b 3. e 4. a 5. d

True-false: 1. F 2. T 3. T 4. T 5. F 6. T

Multiple choice: 1. b 2. d 3. d 4. c 5. d 6. a

Words in context: 1. classic 2. supporting 3. thankless 4. annoyed
5. constant 6. computation 7. automatic

Chapter 18 Learning with the Computer

Have You Missed Something?

Sentence completion: 1. keeping you organized

2. save you time and energy 3. programming

Matching: 1. e 2. c 3. b 4. f 5. d 6. g 7. a

True-false: 1. F 2. F 3. T 4. F 5. T 6. F 7. T

8. F 9. F 10. T

Multiple choice: 1. a 2. b 3. b 4. d 5. b 6. d

Words in context: 1. machines 2. prediction 3. with results
4. increase 5. cloudy 6. twists 7. general 8. theory

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SOCIAL PSYCHOLOGY

Social Construction of the Self

Social Comparison / Social Identity

Social Perception

The Role of Schemas / First Impressions.

Explaining Behavior: Attribution

Focus on Research: Attribution Across Cultures

Biases in Attribution

Attitudes

The structure of attitudes

Forming Attitudes

Changing Attitudes

Prejudice and Stereotypes

Theories of Prejudice / Reducing Prejudice

Interpersonal Attraction

Keys to Attraction

Intimate Relationships and Love

Social Influence

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Linkages: Motivation and the Presence of Others

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Evaluating Milgram's Studies

Aggression

Why Are People Aggressive?

When Are People Aggressive?

Thinking Critically: Does Pornography Cause Aggression?

Altruism and Helping Behavior

Why Do People Help?

Cooperation, Competition, and Conflict

Group Processes

Group Leadership / Groupthink

We all live with and among other people, and how we manage to do that is the realm of social psychology. This chapter looks at how our thoughts and behaviors affect other people and how, in turn, their thoughts and behaviors affect us. It explores how perception, learning, memory, thinking, and emotion occur in relation to other people; how people think about themselves and others; why we may like one person but dislike another; how people form and change attitudes; and why and how we judge other people, sometimes in biased ways. Social pressure, ranging from unspoken social rules to commands for obedience, is another concern of social psychologists. The chapter also reviews some of the helpful, cooperative, competitive, and aggressive ways in which people behave toward one another in the workplace and in other social situations. Finally, it considers the impact of social influence on group decision making and group processes.

Reading this chapter will give you the tools to answer the following questions:

- **How do I compare myself to others and protect my self-esteem?**
- **How do we form first impressions?**
- **How do our attitudes affect our behavior?**
- **How does prejudice develop?**
- **What factors influence who likes whom?**
- **How does social pressure get people to conform?**
- **How can someone make you do something you don't want to do?**
- **What role do genes play in shaping aggression?**
- **What motivates people to help?**
- **What factors influence leadership effectiveness?**

When, on March 26, 1997, police in Rancho Santa Fe, California, entered a house rented by Marshall Applewhite, they could scarcely believe their eyes. There, on beds in every room, they found the peacefully composed bodies of thirty-nine people, all of whom had taken a lethal dose of phenobarbital mixed with vodka or pudding. These people, all members of a group which came to be known as the Heaven's Gate cult, had taken their own lives because Applewhite

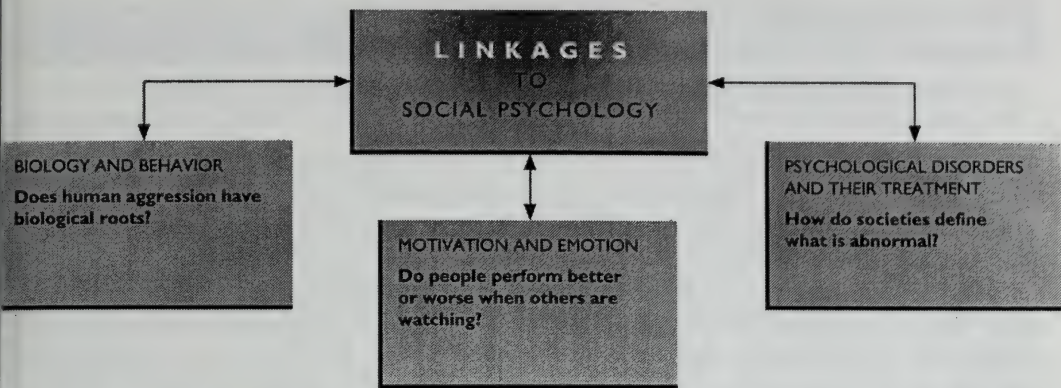


FIGURE 14.1

Linkages to Social Psychology

As social beings, our thoughts, feelings, and behavior are influenced by other people in many ways. Social psychologists' study of these influences is linked to many other sub-fields of psychology, of which we note just three examples.

had convinced them that suicide would lead, not to death, but to a shedding of the "temporary vessels" that were their bodies. He also told them that they would ascend into the heavens to join the crew of an alien space ship that was supposedly concealed in the tail of the Hale-Bopp comet, which was visible from Earth at the time. Were all these cult members suffering from a mental disorder? Probably not. Their self-destructive behavior was more likely due to the long-term influence of their powerful leader, reinforced by the acceptance and elaboration of his views among the group members.

The study of how people influence and are influenced by other people is the domain of **social psychology**. This area of research extends from the individual to the family, the culture, and the rest of world, with linkages to many other areas of psychology (see Figure 14.1). In this chapter, we focus on several issues relating to social psychology, including **social cognition**, the mental processes associated with how people perceive and react to other individuals and groups, and group and interpersonal behaviors such as conformity, aggression, and cooperation. One important aspect of social cognitive processes is how we view ourselves (Fiske & Haslam, 1996; Smith & Mackie, 1995).

social psychology The subfield of psychology that explores the effects of the social world on the behavior and mental processes of individuals and groups.

social cognition Mental processes associated with people's perceptions of and reactions to other people.

Social Construction of the Self

■ How do I compare myself to others and protect my self-esteem?

Each of us lives in both a personal and a social world. You experience your thoughts and feelings as personal even though they have been influenced by others.

The thoughts, feelings, and beliefs about what characteristics you have and who you are make up your **self-concept**. Although your self-concept is unique to you, it is a product of your social and cultural environment. In the chapters on human development and personality, we described how each individual develops within a cultural context. We explored how collectivist and individualistic cultures emphasize different core values and encourage contrasting definitions of the self. As you will see in this chapter, culture also provides the context for **self-esteem**, the evaluations you make of your worth as a human being. Let's look at how self-esteem develops.

Social Comparison

People spend a lot of time thinking about themselves, trying to evaluate their own perceptions, opinions, values, abilities, and so on. Decades ago, Leon Festinger (1954) noted that self-evaluation involves two distinct types of questions: those that can be answered by taking objective measurements and those that cannot. You can determine your height or weight by measuring it, but for other types of questions—about your creativity or attractiveness, for example—there are no objective criteria. In these cases, according to Festinger's theory of **social comparison**, people evaluate themselves in relation to others. When you wonder how creative, interesting, or attractive you are, you use *social* rather than objective criteria (Butler, 1992; Lyubomirski & Ross, 1997).

To whom do you compare yourself? Festinger said that people usually look to others who are similar to themselves. For example, if you are curious about how good at science you are, you most likely compare yourself to fellow students at your own level of experience and ability, not to Albert Einstein or Marie Curie (Major, Sciacchitano & Crocker, 1993). The categories of people you feel you belong to, and usually compare yourself to, are called your **reference groups**.

The performance of individuals in your reference groups can affect your self-esteem (Buunk, 1995). For example, if being good at science is important to you, knowing that someone in your reference group always scores much higher than you on science tests can lower self-esteem. To protect their self-esteem, people sometimes compare themselves to those who are not as good, a strategy called *downward social comparison* (Wills, 1991). Alternatively, they might tell themselves that the superior performer is

self-concept The way one thinks of oneself.

self-esteem The evaluations people make about their worth as human beings.

social comparison Using other people as a basis of comparison for evaluating oneself.

reference groups Categories of people to whom individuals compare themselves.

not really similar enough to be in their reference group, or even that the ability in question is not that important to them (Baumeister, 1995; Tesser, 1988).

An unfavorable comparison of your own status with that of others often produces the perception of **relative deprivation**—the belief that whatever you are getting, it is less than what you deserve (Aronson, Wilson & Akert, 1997). When the average person constantly identifies very wealthy people as a reference group, the resulting relative deprivation can create depression and anxiety (Taylor & Lobel, 1989). And when a large group experiences relative deprivation, political unrest may follow. The turmoil leading to great political upheavals, from the American Revolution to the overthrow of European communism, usually starts after the members of an oppressed group experience some improvement in their lives and begin to compare their circumstances with those in other groups (Aronson, Wilson & Akert, 1997). With this improvement comes elevated expectations about what they deserve.

Social Identity Theory

Stop reading for a moment and complete the following sentence: “I am a(n)_____.” Some people fill in the blank using characteristics like “hard worker,” “good sport,” or some other aspect of their *personal* identity. However, many others identify themselves using a word or phrase that refers to their nationality, gender, or religion. These responses reflect **social identity**, our beliefs about the groups to which we belong. Our social identity is therefore a part of our self-concept (Smith & Henry, 1996).

Our social or group identity permits us to feel part of a larger whole (Smith & Mackie, 1995). Its importance is seen in the pride that people feel when a member of their family graduates from college or when a local team wins a big game (Hogg & Hardie, 1991). In wars between national, ethnic, or religious groups, individuals sacrifice and sometimes die for the sake of their group identity. A group identity is also one reason people donate money to those in need, support friends in a crisis, and display other helping behaviors. As we shall see later, however, defining ourselves in terms of a group identity can foster an “us versus them” mentality that sets the stage for prejudice, discrimination, and intergroup conflict (Smith, 1993).

Social Perception

■ How do we form first impressions?

There is a story about a company president who was having lunch with a man being considered for an executive position. When the man salted his food without first tasting

relative deprivation The sense that a person is not doing as well as others in the same reference group.

social identity The beliefs we hold about the groups to which we belong.

social perception The processes through which people interpret information about others, draw inferences about them, and develop mental representations of them.

it, the president decided not to hire him. The reason, she explained, was that the company had no room for a person who acted before collecting all relevant information. The candidate lost his chance because of the company president's social perception, the processes through which people interpret information about others, form impressions of them, and draw conclusions about the reasons for their behavior. In this section we will examine how and why social perception influences our thoughts, feelings, and actions.

The Role of Schemas

The perception of people follows many of the same laws that govern the perception of objects, including the Gestalt principles. Consider Figure 14.2. Consistent with Gestalt principles, most people would describe it as "a square with a notch in one side," not as eight straight lines (Woodworth & Schlosberg, 1954). The reason is that they interpret new information using the mental representations, or schemas, that they already have about squares. In short, they interpret this diagram as a square with a slight modification.

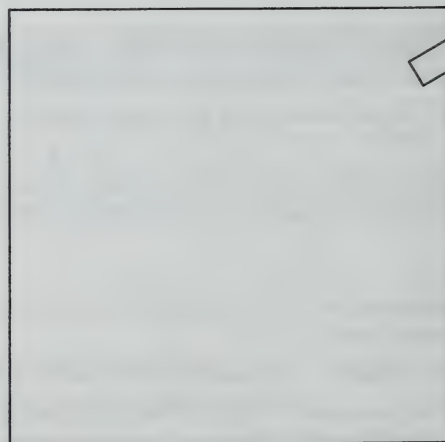
Schemas about people, too, can affect our perception of them. For one thing, schemas influence what we pay attention to and what we ignore. We tend to process information about the other person more quickly if it confirms our beliefs about that person's gender or ethnic group, for example, than if it violates those beliefs (Devine, 1995). Second, schemas influence what we remember about others. In one study, if people thought a woman they saw in a videotape was a waitress, they recalled that she had a beer with dinner and owned a TV set. Those who thought she was a librarian remembered that she was wearing glasses and liked classical music (Cohen, 1981). Finally, schemas affect our judgment about the behavior of others (Fiske, 1995). Thomas Hill and his colleagues (1989) found that participants' ratings of male and female friends' sadness were influenced not only by the friends' actual behavior but also by the participants' general schemas about how much sadness men versus women experience.

LINKAGES Do we sometimes perceive people as we perceive objects? (a link to Sensation and Perception)

FIGURE 14.2

A Schema-Plus-Correction

People who see an object like this tend to use a pre-existing mental representation (their schema of a square) and then correct or modify it in some way (here, with a notch).



In other words, through “top-down” processing, schemas about people influence person perception. And just as they help us read sentences whose words have missing letters, schemas also allow us to efficiently “fill in the blanks” about people. Indeed, they help us to categorize quickly and respond appropriately in social situations. Only when our schemas and expectations are violated do we realize that schemas can create errors in judgment about other people, leading to narrow-mindedness and even prejudice.

First Impressions

Our schemas about people shape our first impression of them. That impression, in turn, influences both our later perceptions of their behavior and our reactions to it. First impressions are formed quickly, usually change slowly, and typically have a long-lasting influence. No wonder they are so important in the development of social relations (Smith & Mackie, 1995). How do people form impressions of other people? And why are they so resistant to change?

Forming Impressions Think about your first impression of a close friend. It probably formed rapidly, because, as mentioned earlier, existing schemas create a tendency to automatically infer a great deal about a person on the basis of limited information (Feldman, 1998). An ethnic name, for example, might have caused you to draw inferences about your friend’s religion, food preferences, or temperament. Clothing or hair-style might have led you to make assumptions about her political views or taste in music. These inferences and assumptions may or may not be accurate. How many turned out to be true in your friend’s case?

One schema has a particularly strong influence on first impressions: We tend to assume that the people we meet hold attitudes and values similar to our own (Hoyle, 1993). So, all else being equal, we are predisposed to like other people. However, it takes very little negative information to change our minds. Why? Others can behave positively toward us because they are nice, because they like us, because they want to sell us insurance, or for many other reasons. People’s negative acts, however, suggest only that they are unfriendly or have other undesirable traits (Coovert & Reeder, 1990). Accordingly, negative information attracts more attention and carries more weight than positive information in shaping first impressions (Klein, 1991).

Lasting Impressions Does your friend seem the same today as when you met? First impressions can change, but the process is usually very slow. One reason is that humans tend to be “cognitive misers” (Fiske, 1995). We like to maintain our existing beliefs about the world, often using our schemas to preserve a reality that fits our expectations. Holding onto existing impressions appears to be part of this effort. Thus, if your friend recently violated your expectations, your view of her probably did not change much, if at all. In fact, you may have acted to preserve your impression by thinking something like “She is not herself today.” In other words, impressions change slowly because the meaning we give to new information about people is shaped by what we already know or believe about them (Ditto & Lopez, 1992).

Self-Fulfilling Prophecies Another reason first impressions tend to be stable is that we often do things that cause others to confirm our impressions (Harris et al., 1992). For example, students whose teachers expect them to do poorly in mathematics may get the message, exert less effort, and perform below their ability level (Jussim & Eccies, 1992). When, without our awareness, schemas cause us to subtly lead people to behave in line with our expectations, a **self-fulfilling prophecy** is at work. In one experiment on self-fulfilling prophecies, men and women participated in “get acquainted” conversations over an intercom system. Before the conversations took place, the men were shown photographs and told, falsely, that they were pictures of their partners. Some saw a photograph of an obese woman, while others saw a picture of a woman of normal weight. In fact, the women looked nothing like the photographs. Independent judges listened to tapes of the conversations (but saw neither participant) and rated the women’s behavior and personality. The women whom the men thought were of normal weight were judged as more articulate, lively, interesting, exciting, and fun to be with. Apparently, when the men thought their partners were of normal weight, they were more friendly and engaging themselves. This behavior, in turn, elicited more positive reactions from the women. In contrast, men who thought their partners were overweight behaved in ways that drew comparatively dull responses (Snyder & Haugen, 1994, 1995).

Self-fulfilling prophecies also help maintain judgments about groups. If you assume that members of a certain ethnic group are pushy or aggressive, for example, you might display defensiveness or even hostility toward them. Faced with this behavior, members of the group might become frustrated and angry. Their reactions fulfill your prophecy and perpetuate the impressions that created it (Ross & Jackson, 1991).

Explaining Behavior: Attribution

So far, we have examined how people form impressions about the characteristics of other people. But perceptions of others also include explanations of behavior. People tend to form *implicit theories* about why people (including themselves) behave as they do and about what behavior to expect in the future (Gilbert, 1995). Psychologists use the term **attribution** to describe the process people go through to explain the causes of behavior (including their own).

Suppose a classmate fails to return borrowed notes on time. You could attribute the behavior to many causes, from an emergency situation to selfishness. Which of these alternatives you choose is important because it will help you *understand* your classmate’s behavior, *predict* what will happen if this person asks to borrow something in the future, and decide how to *control* the situation should it arise again. Similarly, attributing your partner’s nagging to stress-induced irritability or to lack of love can influence whether you will work on the relationship or seek to dissolve it (Bradbury et al., 1996).

self-fulfilling prophecy A process in which an initial impression causes us to elicit behavior in another that confirms the impression.

attribution The process of explaining the causes of people’s behavior, including one’s own.

People typically attribute behavior in a particular situation to either primarily internal causes (characteristics of the person) or primarily external causes (aspects of the situation). For example, if you thought your classmate's failure to return your notes was due to lack of consideration or laziness, you would be making an *internal attribution*. If you thought that the oversight was due to time pressure caused by an upcoming exam or a family crisis, you would be making an *external attribution*. Similarly, if you were to fail a test, you could explain it by concluding that you're not very smart (internal attribution) or that your work schedule left you too little time to study (external attribution). The attribution that you make, in turn, might determine how much you study for the next exam or even whether you decide to stay in school.

Most attribution theories were developed by North American psychologists who assumed that the factors leading to internal or external attributions are the same all over the world. These theories predict, for example, that anyone, anywhere, who sees a woman helping someone who had once helped her would attribute her actions to an obligation to return a favor (an external cause), not to her general helpfulness (an internal cause).

FOCUS ON RESEARCH

Attribution Across Cultures

■ What was the researchers' question?

Are such attributional patterns indeed universal? To explore this question, Joan Miller and David Bersoff (1994) conducted a cross-cultural experiment in India and the United States.

■ How did the researchers answer the question?

The experimenters asked sixty U.S.-born students at Yale University and sixty Hindu students from the University of Mysore in India to read a brief story about helping. Half the students were male, half were female. They all read the story in their own language. The independent variable in the study was the kind of helping that occurred in the stories (reciprocal versus spontaneous). The dependent variable was the students' explanations for the helping that was portrayed.

Here is a modified version of one of the stories about reciprocal helping:

One day John noticed that a neighbor, Bill, was planting a new garden. John had plenty of free time so he helped Bill plant his garden. Several weeks later, Bill, the man whom John had helped previously, noticed that John was painting a fence in his yard. Bill had plenty of free time, so he offered to help John paint his fence.

In a similar story about spontaneous helping, a man offers to help his friend paint a fence, but the friend had not previously helped him. Half the stories were about males, half about females. After reading the stories, each participant rated how well each of several reasons explained the helper's actions. Giving a high rating to a reason such as

“because he likes to help” would suggest an internal attribution; a high rating for “she owed her a favor” would suggest an external attribution. The students were also asked to say whether they thought the helper felt a moral responsibility to be helpful.

■ What did the researchers find?

Taking cultural differences into account, the researchers hypothesized that the Americans would attribute reciprocal helping to external factors, whereas the Hindus in India would attribute it to internal factors (Miller, 1994; Miller & Bersoff, 1995). Results from both male and female students supported this hypothesis. The American students tended to rate “repaying a favor” (an external cause) as a much better explanation of reciprocal helping than “liking to help” (an internal cause). Fewer than 2 percent of them thought that reciprocal helpers felt a moral responsibility to help. In contrast, the Indian students tended to believe that reciprocal helping occurred mainly because the helper liked to help; almost 80 percent also said that helpers who returned a favor felt a moral responsibility to do so. Compared to their own ratings of reciprocal helping, the American students saw spontaneous helping as much more attributable to the helper’s enjoyment of helping. The Indian students thought that the spontaneous helpers liked to help slightly *less* than reciprocal helpers.

■ What do the results mean?

Miller (1994) suggested that the differences in the two groups’ responses reflected differences in their cultural experiences. She noted that Hindus in India have a “duty-based” moral system in which helping out of social obligation is just as moral as helping in the absence of prior favors. Further, they tend not to distinguish between helping that is motivated by personal traits and helping that is motivated by social duty. In contrast, people from Euro-American cultures tend to believe that social obligations may force a person to help even if that person does not have a “helpful” personality.

■ What do we still need to know?

The results of Miller and Bersoff’s experiment highlight once again the danger of assuming that phenomena seen in Euro-American cultures generalize to all cultures. Cross-cultural differences in attribution and other aspects of social cognition may help to explain why people in different cultures sometimes have so much difficulty in understanding one another. Yet, with the increasing use of technological means to communicate, negotiate, and work together across great distances, recognition of these differences is more important than ever.

Biases in Attribution

Whatever their background, most people are usually logical in their attempts to explain behavior (Trope, Cohen & Alfieri, 1991). However, they are also prone to *attributional biases*, or errors, that can distort their view of behavior (Gilbert, 1995).

The Fundamental Attribution Error North American psychologists have paid special attention to the **fundamental attribution error**, a tendency to overattribute the behavior of others to internal factors (Gilbert & Malone, 1995). Imagine that you hear a student give an incorrect answer in class. You will probably attribute this behavior to an internal cause and infer that the person is not very smart. In doing so, however, you might not be taking into account possible external factors (such as lack of study time).

The fundamental attribution error has some significant consequences. For one thing, it may generate overconfidence about our impressions of other people. It also leads to underestimates of the extent to which another person's behavior is due to external causes and, hence, to underestimates of how much the person's behavior might vary across situations (Gilbert & Malone, 1995). In relation to personality, the fundamental attribution error helps explain why, despite the fact that situations often influence our behaviors more than traits, most people believe that traits are the major cause of behaviors.

A related form of attributional bias is called the *ultimate attribution error*, whereby positive actions performed by people from a different ethnic or social group are attributed to external causes, such as luck, whereas their negative actions are attributed to internal causes, such as dishonesty (Pettigrew, 1979). People who commit this error see good deeds done by those in their *own* group as due to internal factors and bad deeds as stemming from external causes. Thus the ultimate attribution error fosters and maintains negative views of other groups and positive views of one's own group (Devine, 1995).

Like other aspects of social cognition, these attributional biases are not universal. Research suggests that people in collectivist cultures such as India, China, Japan, and Korea are less likely than those in the individualist cultures of North America and Europe to commit the fundamental attribution error or the ultimate attribution error (Morris & Peng, 1994; Rhee et al., 1995). And even within Euro-American cultures, there are individual differences in people's vulnerability to these errors (Ross & Nisbett, 1991). According to one study, for example, people raised in the southern United States were more inclined than northerners to make external attributions (Sims & Baumann, 1972).

The inclination toward internal attributions is much less pronounced when people explain their own behavior. In fact, there tends to be an **actor-observer bias**: Whereas people often attribute *other* people's behavior to internal causes, they tend to attribute their *own* behavior to external factors, especially when that behavior is inappropriate or inadequate (Baumeister, 1995). For example, when *you* drive slowly, it is because you are looking for an address, not because you are a big loser like that jerk who crawled along in front of you yesterday.

fundamental attribution error A bias toward overattributing the behavior of others to internal factors.

actor-observer bias The tendency to attribute other people's behavior to internal causes while attributing one's own behavior to external causes.

IN REVIEW Some Biases in Social Perception

Bias	Description
Importance of first impression	Ambiguous information is interpreted in line with a first impression, and the initial schema is recalled better and more vividly than any later correction to it. Actions based on this impression may elicit behavior that confirms it.
Fundamental attribution error	The tendency to attribute the behavior of others to internal factors.
Actor-observer bias	The tendency for actors to attribute their own behavior to external causes and for observers to attribute the behavior of others to internal factors.
Self-serving bias	The tendency to attribute one's successes to internal factors and one's failures to external factors.

The actor-observer bias occurs mainly because people have different kinds of information about their own and others' behavior (Krueger, Ham & Linford, 1996). When *you* are acting in a situation—giving a speech, perhaps—the information most available to you is likely to be external and situational, such as the temperature of the room and the size of the audience. You also have a lot of information about other external factors, such as the amount of time you had to prepare your talk or the upsetting conversation that occurred this morning. Whatever the outcome of your efforts, you can easily attribute it to one or all of these external causes. But when you observe someone else, the most obvious information in the situation is *that person*. You do not know what happened to the person last night or this morning, so you are likely to attribute whatever he or she does to stable, internal characteristics (Gilbert & Malone, 1995).

Of course, people do not always attribute their own behavior to external forces. In fact, whether they do so often depends on whether the outcome is positive or negative. One group of researchers assessed the attributions made by introductory psychology students about their performance on a midterm examination (Smith & Ellsworth, 1987). The students who did well perceived the test as being fair and attributed their performance to their ability. But the ones who performed poorly believed that the test was unfair, and they attributed their performance to a picky instructor. These students showed a **self-serving bias**, the tendency to take personal credit for success but to blame failure on external causes.

The self-serving bias occurs, in part, because people are motivated to maintain their self-esteem—and ignoring negative information is one way to do so. If you just failed an

self-serving bias The cognitive tendency to attribute one's successes to internal characteristics while blaming one's failures on external causes.

exam, it is painful to admit that it was fair. In short, people think about their failures and shortcomings in ways that protect their self-esteem (Aronson, Wilson & Akert, 1997).

Self-protective cognitive biases help us temporarily escape from painful situations, but they also set the stage for a distorted view of reality and create problems in the long run. ("In Review: Some Biases in Social Perception" summarizes the common cognitive biases discussed here).

Attitudes

■ How do our attitudes affect our behavior?

Our views about health, safety, or any other topic reflect our attitudes. Social psychologists have studied this aspect of social cognition longer and more intensely than any other. An **attitude** is the tendency to think, feel, or act positively or negatively toward objects in our environment (Eagly & Chaiken, 1993; Petty & Wegener, 1998). Attitudes play an important role in guiding how we react to other people, what causes and politicians we support, which products we buy, and countless other daily decisions.

The Structure of Attitudes

Social psychologists have long viewed attitudes as having three components (Eagly & Chaiken, 1993). The *cognitive* component is a set of beliefs about the attributes of the attitude object. The emotional, or *affective*, component includes feelings about the object. And the *behavioral* component pertains to the way people act toward the object. Ideally, these components would be in harmony, allowing us to predict people's behavior toward the homeless, for example, on the basis of the thoughts or feelings they express, and vice versa. This is often not the case, however (Kraus, 1995). Many people's charitable thoughts and sympathetic emotions regarding the homeless are never translated into actions aimed at helping them.

What determines whether people's behavior will be consistent with the cognitive and affective components of their attitudes? Several factors are important. For one thing, consistency is most likely when the behavior in question is in line with a *subjective norm*, our view of how important figures in our lives want us to act. Conflict between attitudes and subjective norms may cause people to behave in ways that are inconsistent with their attitudes (Terry & Hogg, 1996). Thus, for example, someone who believes that the rights of gays and lesbians should be protected might not campaign for this cause because doing so would upset family members or co-workers who are strongly against it. Second, attitude-consistent behavior is more likely when people have *perceived control*, the belief that they can actually perform such behavior (Madden, Ellen & Ajzen, 1992). You may hold a positive attitude about becoming an opera star, but if you don't believe it is possible, you are unlikely even to try. Third, *direct experience* with the atti-

attitude A predisposition toward a particular cognitive, emotional, or behavioral reaction to objects in one's environment.

tude object increases the likelihood of attitude-consistent behavior (Kraus, 1995). If your positive attitude toward eating squid, say, is based on having actually tasted it, you are more likely to buy it than if your attitude stems solely from its image. Finally, people who *monitor*, or pay close attention to, the behavior of others in social situations are less likely to behave in accordance with their own attitudes (Kraus, 1995).

Forming Attitudes

People are not born with specific attitudes toward specific objects, but their attitudes about new objects begin to appear in early childhood and continue to emerge throughout life. How do attitudes form?

Inherited predispositions toward the temperaments may have some indirect effects (Oskamp, 1991; Tesser, 1993), but the formation of new attitudes is influenced mainly by the *learning principles*. In childhood, modeling and other forms of social learning play a major role. Children learn not only the names of objects but also what they should believe and feel about them and how they should act toward them. For example, a parent's words may teach a child not only that snakes are reptiles but also that they should be feared and avoided. So as children learn concepts such as "reptile" or "work," they learn attitudes about those concepts, too (Olson & Zanna, 1993).

Classical and operant conditioning can also shape positive or negative attitudes (Krosnick et al., 1992). Advertisers associate enjoyable music or soothing colors with the products they try to sell (Aronson, Wilson & Akert, 1997; Pratkanis & Aronson, 1991), and parents, teachers, and peers reward children for stating particular views. The *mere-exposure effect* is influential as well. All else being equal, attitudes toward an object will become more positive the more frequently people are exposed to it (Bornstein, 1992). Often, people come to like a song only after they have heard it several times; so guess why certain commercials and political ads are aired so often.

Changing Attitudes

The nearly \$100 billion a year spent on advertising in the United States alone provides but one example of how people constantly try to change our attitudes. Stop for a moment and make a list of other examples, starting, perhaps, with the persuasive messages of groups concerned with abortion or recycling—and don't forget your friends who want you to do something that you think is a waste of time.

A Model of Attitude Change Whether a persuasive message succeeds in changing attitudes depends primarily on three factors: (1) the characteristics of the person communicating the message, (2) the content of the message, and (3) the audience who receives it (Petty & Wegener, 1998). The **elaboration likelihood model** of attitude

elaboration likelihood model A model of attitude change suggesting that people can change their attitudes through a central route, by considering an argument's content, or through a peripheral route in which they rely on irrelevant persuasion cues.

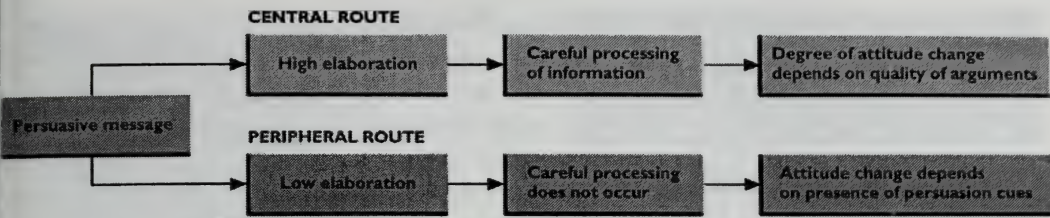


FIGURE 14.3
The Elaboration Likelihood Model of Attitude Change

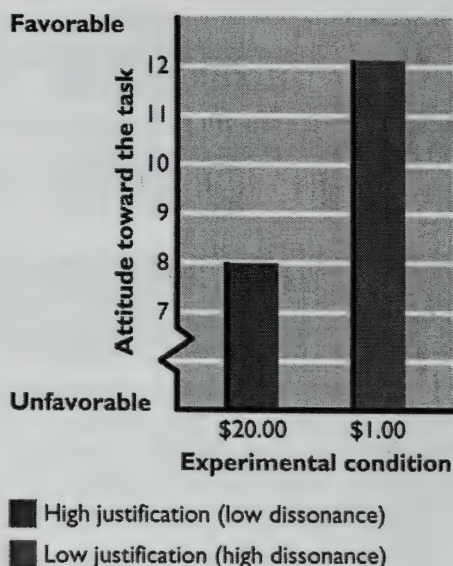
The central route to attitude change begins with high elaboration, which includes careful processing and evaluation of a message’s content. The peripheral route involves low elaboration and reliance on persuasion cues such as the attractiveness of the person making the argument (Cacioppo, Petty & C rites, 1993).

change—illustrated in Figure 14.3—provides a framework for understanding when and how these factors affect attitude change. The model is based on the premise that persuasive messages can change people’s attitudes through one of two main routes. The first is called the peripheral route because, when it is activated, we devote little attention to the central content of the persuasive message and tend to be affected instead by peripheral persuasion cues, such as the confidence, attractiveness, or other characteristics of the person who delivers the message. Persuasion cues influence attitude change even though they may be irrelevant to the logic or validity of the message itself. Commercials in which movie stars or other attractive nonexperts endorse pain relievers are designed to encourage the peripheral route to attitude change. By contrast, when the central route to attitude change is activated, the content of the message becomes more

IN REVIEW Forming and Changing Attitudes	
Type of Influence	Description
Modeling and conditioning	Attitudes are usually formed through observation of how others behave and speak about an attitude object, as well as through classical and operant conditioning.
Elaboration likelihood model	People change attitudes through either a central or peripheral route, depending on factors such as personal involvement and personal preferences.
Cognitive dissonance	Holding inconsistent cognitions can motivate attitude change.

FIGURE 14.4**Cognitive Dissonance and Attitude Change**

According to cognitive dissonance theory, people paid \$20 to say a boring task was enjoyable had clear justification for lying and should experience little dissonance between what they said and what they felt about the task. Indeed, their attitude toward the task did not change much. However, people who received just \$1 had little justification to lie and reduced their dissonance mainly by displaying a more positive attitude toward the task.



important in determining attitude change than the characteristics of the communicator. A person following the central route uses logical steps—like those outlined in the Thinking Critically sections of this book—to analyze the content of the persuasive message, including the validity of its claims, whether it leaves out pertinent information, alternative interpretations of evidence, and so on.

What determines which route people will follow? Personal involvement with message content is an important factor. The elaboration likelihood model proposes that the more personally involving a topic is, the more likely the central route will be activated (Petty, Priester & Wegener, 1994; Petty & Wegener, 1998). Suppose, for example, that you hear someone advocating the cancellation of student loans in Chile. This message might persuade you via the peripheral route if it comes from someone who looks attractive and sounds intelligent. However, you are more likely to follow the central route if the message proposes terminating student loans at *your* school. You might be persuaded, but only if the logic of the message is irrefutable. This is why celebrity endorsements tend to be more effective when the products being advertised are relatively unimportant to the audience.

Persuasive messages are not the only means of changing attitudes. Another approach is to get people to act in ways that are inconsistent with their current attitudes, in the hope that they will adjust those attitudes to match their behavior. Often, such adjustments do occur. Cognitive dissonance theory attempts to explain why.

Cognitive Dissonance Theory Leon Festinger's (1957) classic **cognitive dissonance theory** holds that people want their thoughts, beliefs, and attitudes to be in harmony

cognitive dissonance theory A theory stating that uneasiness results when people's thoughts are inconsistent with one another, and that such uneasiness motivates people to restore consistency.

with one another. When these various cognitions are inconsistent, or *dissonant*, people become anxious and motivated to make them more consistent (Eliot & Devine, 1994). For example, someone who believes that “smoking is bad” but must also acknowledge that “I smoke” would be motivated to reduce the resulting dissonance. But it is often difficult to change behavior, so people usually reduce cognitive dissonance by changing inconsistent attitudes. Rather than quit smoking, the smoker might decide that smoking is not so bad.

In one of the first studies of cognitive dissonance, Festinger and his colleague Merrill Carismith (1959) asked people to turn pegs in a board, a very dull task. Later, some of these people were asked to persuade a person waiting to participate in the study that the task was “exciting and fun.” Some were told that they would be paid \$1 to tell this lie. Others were promised \$20. After they had talked to the waiting person, their attitudes toward the dull task were measured.

Figure 14.4 shows, and suggests an explanation for, the surprising results: The people who were paid just \$1 to lie liked the dull task more than those who were paid \$20 (Festinger & Carismith, 1959).

Hundreds of other experiments support the conclusion that people often reduce dissonance by changing their attitudes (e.g., Aronson, Wilson & Akert, 1997). For example, Michael Lieppe and Donna Eisenstadt (1994) asked European-American college students to write essays in support of larger scholarships for African-American students. Most of the essay-writers opposed this proposal. Some of the students were told that writing the essays was voluntary; for others, the essays were required. In keeping with cognitive dissonance theory, the students whose only justification for writing the essays was their own free choice developed more positive attitudes toward African-American students. The attitudes of the students given no choice did not change, presumably because they could justify their attitude-inconsistent behavior as having been demanded by the experimenter.

The power of cognitive dissonance to change attitudes may be greater in the individualist cultures of Europe and North America than in collectivist cultures such as Japan (Moghaddam, Taylor & Wright, 1993). Where group rather than individual values and goals are emphasized, behaving at odds with one’s personal beliefs may create less discomfort—and less motivation for attitude change—because holding to those beliefs tends to be less important for self-esteem. One study, for example, showed that Canadian students were much more likely to experience cognitive dissonance than their Japanese counterparts (Heine & Lehman, 1997). (“In Review: Forming and Changing Attitudes” summarizes some of the main processes through which attitudes are formed and changed.)

Prejudice and Stereotypes

■ How does prejudice develop?

All of the principles underlying impression formation, attribution, and attitudes come together in prejudice and stereotypes (Hamilton & Sherman, 1994). **Stereotypes** are the perceptions, beliefs, and expectations a person has about members of some group. They are schemas about entire groups of people (Feldman, 1998). Typically, they involve the assumption (usually false) that all members of a group share the same characteristics. The characteristics that make up the stereotype may be positive, but more often they are negative. The most prevalent and powerful stereotypes focus on observable personal attributes, particularly ethnicity, gender, and age (Devine, 1995; Dovidio & Gaertner, 1986).

LINKAGES Can subconscious processes alter our reaction to people? (a link to Consciousness)

Stereotyping often leads to **prejudice**, which is a positive or negative attitude toward an individual based simply on his or her membership in some group (Fiske & Von Hend, 1992). *Prejudice* means literally “to prejudge.” Many theorists believe that prejudice, like other attitudes, has cognitive, affective, and behavioral components. Stereotyped thinking is the cognitive component of prejudicial attitudes. The hatred, admiration, anger, and other feelings people have about stereotyped groups constitute the affective component. The behavioral component of prejudice involves discrimination, which is differential treatment of individuals who belong to different groups.

Theories of Prejudice

Not all prejudice and stereotyping occur for the same reason (Duckitt, 1994). Three theories, each with supporting research, help to explain many instances of stereotyping and prejudice.

Motivational Theories For some people, prejudice against certain groups meets some of their needs and increases their sense of security. Research by T. W. Adorno and his colleagues suggests that prejudice may be especially likely among people whose parents used punishment or harsh words to teach their children that they must defer to and obey all those with a higher status than themselves. This kind of authoritarian parenting encourages the development of a cluster of traits called the *authoritarian personality* (Adorno et al., 1950; Stone, Lederer & Christie, 1993). People with an authoritarian personality view the world as a threatening place. One way they protect

stereotypes Impressions or schemas of an entire group of people that involve the assumption that all members of the group share the same characteristics.

prejudice A positive or negative attitude toward an entire group of people.

discrimination Differential treatment of various groups; the behavioral component of prejudice.

themselves from threat is to strongly identify with their own ethnic, cultural, or social group—their *in-group*—and to reject, dislike, and perhaps even punish anyone who is a member of other groups. Disliking these *out-group* members helps people with an authoritarian personality feel safer and better about themselves. Some psychodynamic theorists even suggest that prejudice displaces onto out-groups the hostility that authoritarian personalities originally felt toward their punishing parents.

Another motivational explanation of prejudice involves the concept of social identity discussed earlier. Recall that, whether they have authoritarian parents or not, most people are motivated to identify with their in-group and tend to see it as better than other groups (Billig & Tajfel, 1973; Smith, 1993). As a result, members of an in-group often see all members of out-groups as less attractive and less socially appropriate than those of the in-group and may thus treat them badly (Hamilton & Sherman, 1994; Smith & Mackie, 1995). In short, prejudice may result when people's motivation to enhance their self-esteem causes them to belittle other people.

Cognitive Theories Stereotyping and prejudice may also result from the social-cognitive processes that people use in dealing with the world. There are so many other people, so many situations in which one meets them, and so many behaviors that others might display that one cannot possibly attend to and remember them all. Therefore, people must use schemas and other cognitive shortcuts to organize and make sense of their social world (Hamilton & Sherman, 1994). Often these cognitive processes provide accurate and useful summaries of other people, but sometimes they lead to inaccurate stereotypes. Instead of remembering every single detail about every person we meet, we often group people into social categories such as doctor, senior citizen, Republican, student, Italian, and the like (Rothbart & Lewis, 1994). To further simplify perception of these categories, we tend to see group members as being quite similar to one another. Thus, members of an ethnic group may find it harder to distinguish among specific faces in other ethnic groups than in their own (Anthony, Coopei & Mullen, 1992). People also tend to assume that all members of a different group hold the same beliefs and values, and that those beliefs and values differ from their own (Rokeach & Mezei, 1966). Finally, as people's attention tends to be drawn to distinctive stimuli, noticeably rude behavior by even a few members of an easily identified ethnic group may lead other people to see an *illusory correlation* between rudeness and ethnicity (Hamilton & Sherman, 1994). As a result, they may incorrectly believe that *most* members of that group are rude.

Learning Theories Some prejudice results from conflicts between members of different groups, but people also develop negative attitudes toward groups with whom they have had little or no contact. Like other attitudes, prejudice can be learned. Learning theories suggest that children can acquire prejudices just by watching and listening to the words and deeds of parents, peers, and others (Karlins, Coffman & Walter, 1969). Movies and television also portray ethnic or other groups in ways that teach stereotypes and prejudice (Liebert & Sprafkin, 1988). And, as mentioned earlier, children may be directly reinforced for expressing prejudice. In fact, small children often know about the supposed negative characteristics of many groups long before they ever meet people in those groups (Mackie et al., 1996).

Reducing Prejudice

One clear implication of the cognitive and learning theories of prejudice and stereotyping is that members of one group are often ignorant or misinformed about the characteristics of people in other groups. Before 1954, for example, most black and white schoolchildren in the United States knew very little about one another because they went to separate schools. Then the Supreme Court declared that segregated public schools should be prohibited. In addition to ruling segregation to be unconstitutional, the court provided a real-life test of the **contact hypothesis**, which states that stereotypes and prejudice toward a group will diminish as contact with the group types and prejudice toward a group will diminish as contact with the group increases. (Pettigrew, 1997).

Did the school desegregation process of the 1960s and 1970s confirm the contact hypothesis? In a few schools, integration was followed by a decrease in prejudice, but in most places either no change occurred or prejudice actually increased (Oskamp & Schultz, 1998). However, these results did not necessarily disprove the contact hypothesis. In-depth studies of schools with successful desegregation suggested that contact alone was not enough—indeed, that integration reduced prejudice only when certain social conditions were created (Cook, 1985; Miller, Brewer & Edwards, 1985). First, members of the two groups had to be of roughly equal social and economic status. Second, school authorities had to promote cooperation and interdependence among the members of ethnic groups by having them work together on projects that required reliance on one another to reach success. Third, the contact between group members had to occur on a one-to-one basis. It was only when *individuals* got to know each other that the errors contained in stereotypes became apparent. Finally, the members of each group had to be seen as typical and not unusual in any significant way. When these four conditions were met, the children's attitudes toward one another became more positive.

Elliot Aronson (1995) describes a teaching strategy, called *the jigsaw technique*, that helps create these conditions. Children from several ethnic groups must work on a team to complete a task such as writing a report about a famous person in history. Each child learns, and provides the team with, a separate piece of information about this person, such as place of birth (Aronson, 1990). Studies show that children from various ethnic groups who take part in the jigsaw technique and other cooperative learning experiences show substantial reductions in prejudice toward other groups (e.g., Aronson, Wilson & Akert, 1997). The success reported in these studies has greatly increased the popularity of cooperative learning exercises in U.S. classrooms. Such exercises may not eliminate all aspects of ethnic prejudice in children, but they seem to be a step in the right direction (Burnette, 1997).

Can friendly, cooperative, interdependent contact reduce the more entrenched forms of prejudice seen in adults? It may. When two equal-status adults work jointly toward a common goal, their mutual respect and liking tend to increase (Cook, 1984).

contact hypothesis The idea that stereotypes and prejudice toward a group will diminish as contact with the group increases.

Their successes lead to joint pride, and even mistakes or failures by a partner are often tolerated (Lanzetta & Englis, 1989). The challenge to be met in creating such cooperative experiences is that the participants must be of equal status. This challenge is made more difficult, in the United States and elsewhere, by the sizable status differences that still exist between ethnic groups (Foster & Finchilescu, 1986).

In the final analysis, contact can provide only part of the solution to the problems of stereotyping, prejudice, and discrimination. To reduce ethnic prejudice, we must develop additional educational techniques that address the social cognitions and perceptions that lie at the core of bigotry and hatred toward people who are different from us (Monteith, Zuwerink & Devine, 1994).

Interpersonal Attraction

■ What factors influence who likes whom?

Research on prejudice suggests some of the reasons for which people, from childhood on, may come to dislike or even hate other people. An equally fascinating aspect of social cognition is why people like each other. Folklore tells us that “opposites attract,” but also that “birds of a feather flock together.” Though valid to some degree, each of these statements needs to be qualified. We begin our coverage of interpersonal attraction by discussing the factors that lead to initial attraction; we then examine how liking sometimes develops into more intimate relationships.

Keys to Attraction

Whether you like someone or not depends partly on situational factors and partly on personal characteristics.

The Environment One of the most important determinants of attraction is simple physical proximity (Clark & Pataki, 1995). As long as you do not initially dislike the person, your liking for him or her will increase with additional contact. This phenomenon is another example of the *mere-exposure effect* mentioned earlier (Seamon et al., 1997). For example, Richard Moreland and Scott Beach (1992) varied the number of times that several research assistants (pretending to be students) attended a class. Even though none of the assistants spoke to anyone in the class, they were rated by the other students as more likable the more often they attended. This is one reason why next-door neighbors are much more likely to become friends than people who live farther from one another. Chances are, most of your friends are people whom you met as neighbors, co-workers, or classmates.

The circumstances under which people first meet also influence attraction. You are much more likely to be attracted to a stranger you meet in comfortable as opposed to uncomfortable physical conditions. Similarly, if you receive a reward in the presence of a stranger, the chances that you will like that stranger are increased, even if the stranger is not the one giving the reward (Clark & Pataki, 1995). In one study, for example, an

experimenter judged one person's creativity while another person watched. Compared to those who received a negative evaluation, participants who were evaluated positively tended to like the observer more (Griffitt & Guay, 1969). At least among strangers, then, liking can occur through associating someone with something pleasant.

Similarity People also tend to like those whom they perceive as similar to themselves on variables such as age, religion, smoking or drinking habits, or being a "morning" or "evening" person. Indeed, similarity in attitudes is an important influence on attraction (Lord, 1997).

An especially good predictor of liking is similarity in attitudes about mutual acquaintances, because, in general, people prefer relationships that are *balanced*. Thus, as illustrated in Figure. 14.5, if Meagan likes Abigail, the relationship is balanced as long as they agree on their evaluation of a third person, regardless of whether they like or dislike that third person. However, the relationship will be imbalanced if Meagan and Abigail disagree on their evaluation of a third person.

One reason for the correlation between attitude similarity and liking is that people who share attitudes tend to validate one another's view of the world (Swann, Stein-Seroussi & Giesler, 1992). But attraction can be both a cause and a consequence of similarity (Brehm, 1992). For example, you might like someone because his attitudes are similar to yours, but it is also possible that, as a result of liking him, your attitudes will become more similar to his. Some people even change their perception of a liked person's attitudes so that they seem more similar to their own (Curtis & Miller, 1986).

Physical Attractiveness Physical characteristics are another important factor in attraction, particularly in the early stages of a relationship (Feingold, 1992). From preschool through adulthood, physical attractiveness is a key to popularity with members of both sexes (Aronson, Wilson & Akert, 1997; Dion, 1992). Consistent with the **matching hypothesis** of interpersonal attraction, however, people tend to date, marry, or form other committed relationships with those who are similar in physical attractiveness (Brehm, 1992; Kalick, 1988). One possible reason for this outcome: Although people tend to be most attracted to those with the greatest physical appeal, they also want to avoid rejection by such individuals. In short, it may be compromise, not preference, that leads people to pair off with those who are roughly equivalent to themselves in physical attractiveness (Carli, Ganley & Pierce-Otay, 1991).

Intimate Relationships and Love

There is much about intimate relationships that psychologists do not, and may never, understand. However, they do know something about the characteristics that people find attractive. For example, both men and women like a good sense of humor and helpfulness in members of the opposite sex, as shown in Table 14.1 (Buss, 1988).

matching hypothesis A proposition stating that people are most likely to be attracted to others who are similar to themselves in physical attractiveness.

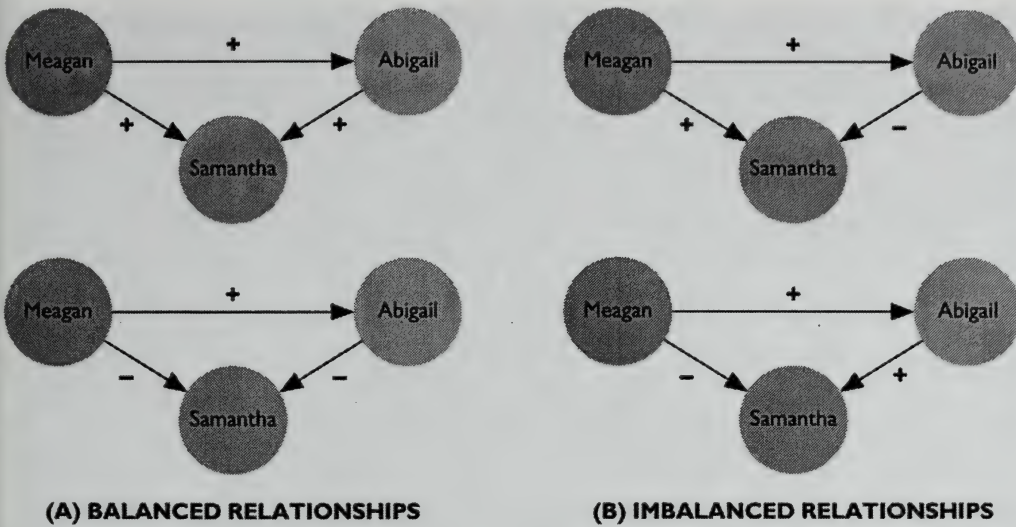


FIGURE 14.5

Balanced and Imbalanced Relationships

Shown here are some common examples of balanced and imbalanced patterns of relationships among three people. The plus and minus signs refer to liking and disliking, respectively. Balanced relationships are comfortable and harmonious; imbalanced ones often bring conflict.

Intimate Relationships Eventually, people who are attracted to each other usually become *interdependent*, which means that the thoughts, emotions, and behaviors of one person affect the thoughts, emotions, and behaviors of the other (Clark & Pataki, 1995). Interdependence occurs in large measure as the thoughts and values of one person become part of the self-concept of the other (Aron et al., 1991). It is thus one of the defining characteristics of intimate relationships.

When asked to name the key ingredients of a successful intimate relationship, people most often mention *affection* and *emotional expressiveness* (Helgeson, Shaver & Dyer, 1987). Signs of affection are important because if one person perceives the other to be uninterested, communication will deteriorate and the person will begin to withdraw (Sayers & Baucom, 1991). Emotional expressiveness is important because it enhances feelings of closeness and commitment, and because the expression of strong emotions is comforting (Greenberg & Stone, 1992).

Other key components of intimate relationships appear to be the *result* of intimacy (Clark & Reis, 1988). One is *social support*, which refers in part to helping with the daily hassles of life and in part to psychological support, such as propping up a friend's confidence (McGuire, 1994). Indeed, research has shown that, in such relationships, each person tends to be more concerned with providing love and support to their partner

Male Attributes	Female Attributes
1. Displayed a good sense of humor.	1. Displayed a good sense of humor.
2. Was sympathetic to her troubles.	2. Kept herself well-groomed.
3. Showed good manners.	3. Was sympathetic to his troubles.
4. Kept himself well-groomed.	4. Showed good manners.
5. Made an effort to spend a lot of time with her.	5. Showered daily.
6. Offered to help her.	6. Kept physically fit to create a healthy appearance.
7. Showered daily.	7. Made up jokes to make men laugh.
8. Kept physically fit to create a healthy appearance.	8. Made an effort to spend a lot of time with him.
9. Exercised.	9. Wore stylish, fashionable clothes.
10. Wore attractive outfits.	10. Offered to help him.

TABLE 14.1

Attributes Rated Most Attractive by Members of the Opposite Sex

Here, according to research by David Buss (1988), are the ten attributes that males and females found most attractive in one another.

than with being rewarded for what they contribute (Clark & Mills, 1993). Intimacy also frequently brings *cohesiveness*, which refers to joint activities such as taking a vacation together, and *sexuality* (Clark, 1994).

Analyzing Love Affection, emotional expressiveness, social support, cohesiveness, sexuality—these characteristics of intimate relationships bring something else to mind: love. Yet intimacy and love are not synonymous. Most theorists agree that there are several different types of love (Brehm, 1992). One widely accepted view distinguishes between passionate love and companionate love (Hatfield, 1988). *Passionate love* is intense, arousing, and marked by both strong physical attraction and deep emotional attachment. Sexual feelings are very strong and thoughts of the other intrude on a person's awareness frequently. *Companionate love* is less arousing but psychologically more intimate. It is marked by mutual concern for the welfare of the other (Hendrick & Hendrick, 1986).

Robert Sternberg (1988) has offered a more comprehensive analysis of love. According to his *triangular theory*, the three basic components of love are *passion*, *intimacy*, and *commitment*. Various combinations of these components result in quite different

types of love. For example, Sternberg suggests that *romantic love* involves a high degree of passion and intimacy, yet lacks substantial commitment to the other person. *Companionate love* is marked by a great deal of intimacy and commitment but little passion. *Consummate love* is the most complete and satisfying. It is the most complete because it includes a high level of all three components. It is the most satisfying because the relationship is likely to fulfill many of the needs of each partner.

Cultural factors have a strong influence on the value that people place on love. In the United States, love is idealized in the popular media; 87 percent of Americans believe that love is crucial to a satisfying marriage. However, in the former Soviet Union, only 40 percent of the people say that they married for love; most did so because of loneliness, shared interests, or an unplanned pregnancy (Baron & Byrne, 1994). In collectivist cultures such as India and Japan, love is considered less important to a successful marriage than is the ability to resolve family conflicts (Matsumoto, 1994; Simmons, von Kolke & Shimizu, 1986).

Strong and Weak Marriages In Western cultures, good communication appears to be very important to marital satisfaction. In fact, the mutual sharing of interests, beliefs, opinions, and the like is often more important than sex (Sternberg & Grajek, 1984). In general, women—but not men—tend to be more satisfied with their marriage when the partners talk a lot about the relationship (Acitelli, 1992). Partners in successful marriages also tend to share one another's view of themselves and each other, even if that view is a negative one (Swann, De La Ronde & Hixon, 1994).

The perception that a relationship is fair or equitable also enhances marital satisfaction (Clark, 1994). After the birth of a first child, for example, many wives find that they have much more work than they had anticipated. If their husbands do not share this work to the degree they expected, wives' marital satisfaction tends to decrease (Hackel & Ruble, 1992). One survey of over 60,000 people found that those who felt unfairly treated in their marriage were the most likely to have had an extramarital affair (Waiseter, Traupmann & Walster, 1978).

A related determinant of long-term marital satisfaction is how the couple deals with the conflict and anger that occur in virtually all marriages (Carstensen et al., 1996). In both happy and unhappy marriages, men tend to respond to their spouse's anger with anger of their own. But in happy marriages, the cycle of angry reactions is ultimately broken, usually by the wife, allowing the couple to deal with the problem at hand during moments of calm (Rusbult et al., 1991). In unhappy marriages, both the husband and wife trade increasingly angry and hurtful remarks until communication breaks down (Gottman & Levenson, 1992). When these episodes become frequent, attributional biases begin to appear. Distressed couples tend to attribute their spouse's negative behaviors to internal causes (such as lack of concern) and positive behaviors to such external causes as the proximity of a holiday (Fincham & Bradbury, 1993). Thus, even if one spouse tries to improve the marriage, these efforts may be dismissed by the other as insincere or unimportant.

Social Influence

■ How does social pressure get people to conform?

So far, we have considered social cognition, the mental processes associated with people's perceptions of and reactions to other people. Broader questions arise as we explore *social influence*, the process through which individuals and groups directly and indirectly influence a person's thoughts, feelings, and behavior. Research has shown, for example, that suicide rates increase following well-publicized suicides and that murder rates increase after well-publicized homicides (Phillips, 1983; Phillips & Cartensen, 1986). Do these correlations mean that media coverage of violence triggers similar violence? Televised violence can play a causal role in aggressive behavior, but there's more to the story than that. For one thing, many of the people murdered soon after a sensational homicide bear some notable similarity to the victim (Cialdini, 1993). This phenomenon—known as “copycat” violence—illustrates the effects of social influence.

Social Norms

The most pervasive yet subtle form of social influence is communicated through social norms. **Norms** are learned, socially based rules that prescribe what people should or should not do in various situations (Levine & Moreland, 1995). Parents, teachers, clergy, peers, and other “agents of culture” transmit norms. Because of the power of norms, people often follow them automatically. At movie theaters in North America and Britain, for example, norms tell us that we should get in line to buy a ticket rather than crowd around the ticket window. They also lead us to expect that others will do the same. By providing information to people about what is expected of them and others, norms make social situations less vague and more comfortable.

One particularly powerful norm is *reciprocity*, the tendency to respond to others as they have acted toward you (Cialdini, 1993). To explore the nature of reciprocity, an investigator sent Christmas cards to strangers, most of whom responded with a card of their own. Some even added a personal note of good cheer (Kunz & Woolcott, 1976). But this norm and others are neither universal nor unchanging (Triandis, 1994). For instance, people around the world differ greatly in terms of the physical distance they maintain between themselves and others while interacting. Indeed, people from South America usually stand much closer to one another than do people from North America. Thus, behavior considered normal and friendly in one culture may be seen as offensive, even abnormal, in another.

The social influence exerted by norms creates orderly social behavior. But social influence can also lead to a breakdown in order. For example, **deindividuation** is a psychological state in which a person becomes “submerged in the group” and loses the

norms Learned, socially based rules that prescribe what people should or should not do in various situations.

deindividuation A psychological state occurring in group members that results in loss of individuality and a tendency to do things not normally done when alone.

sense of individuality (Lord, 1997). When people experience deindividuation, they undergo heightened emotional arousal and an intense feeling of cohesiveness with the group; they appear to become part of the “herd,” and they may perform acts that they would not do otherwise. Deindividuation appears to be caused by two factors (Prentice-Dunn & Rogers, 1989). The first is the belief that one cannot be held personally accountable for one’s actions. The second is a shifting of attention away from internal thoughts and standards and toward the external environment. Having members of the group sing in unison or wear unusual uniforms (such as Ku Klux Klan robes) fosters this shift of attention.

Deindividuation usually results in antisocial acts, and the emotional arousal that is generated makes such behavior difficult to stop (Prentice-Dunn & Rogers, 1989). Fans at rock concerts and athletic events have trampled one another to death in their frenzy to get the best seats; normally mild-mannered adults have thrown rocks or fire bombs at police during political protests. The greater the perceived anonymity, the more extreme the behavior. An analysis of newspaper accounts of lynchings in the United States over a fifty-year period showed that larger lynch mobs were more savage and vicious than smaller ones (Mullen, 1986). Similarly, college students whose heads were covered by hoods were more willing than unhooded students to shock an innocent victim (Zimbardo, 1970). Deindividuation provides an example of how, given the right circumstances, quite normal people can engage in destructive, even violent, behavior.

Linkages: Motivation and the Presence of Others

Social factors such as parental attitudes toward achievement often affect motivation. But a person’s current motivational state is also affected by the mere presence of other people. To illustrate, consider what was probably the first experiment in social psychology, conducted by Norman Triplett in 1897.

Do people perform better or worse when others are watching? (a link to Motivation and Emotion)

Triplett noticed that bicyclists tended to race faster when a competitor was near than when all competitors were out of sight. Did seeing one another remind the riders of the need to go faster to win? To test this possibility, Triplett arranged for bicyclists to complete a twenty-five-mile course under three conditions: riding alone in a race against the clock; riding with another cyclist, but not in competition; or competing directly with another rider. The cyclists went much faster when another rider was present than when they were simply racing against time. This was true even when they were not competing against the other person. Something about the presence of the other person, rather than competition, produced increased speed.

The term **social facilitation** describes circumstances in which the presence of other people can improve performance. This improvement does not always occur, however.

social facilitation A phenomenon in which the mere presence of other people improves a person’s performance on a given task.

Sometimes, having other people present hurts performance, a process known as **social impairment**. For decades, these results seemed contradictory; then, Robert Zajonc (pronounced "ZYE-onze") suggested that both effects could be explained by one process: arousal.

The presence of other people, said Zajonc, increases a person's general level of arousal or motivation (Zajonc, 1965). Arousal increases the tendency to perform those behaviors that are most *dominant*—the ones you know best. This tendency may either help or hinder performance. When you are performing an easy, familiar task such as riding a bike, increased arousal due to the presence of others should allow you to ride even faster than normal. But when a task is hard or unfamiliar, the most dominant responses may be incorrect and cause performance to suffer. Thus, the impact of other people on performance depends on whether the task is easy or difficult. This is true even when the "other person" is a machine that records one's errors at a task (Aiello & Kolb, 1995).

Why does the presence of others increase arousal? One reason is that being watched increases our sense of being evaluated, producing apprehension that in turn increases emotional arousal (Penner & Craiger, 1992). The presence of others may also distract us from the task at hand, or cause us to focus on only one part of it, thus impairing performance (Baron, Kerr & Miller, 1992).

What if a person is not merely in the presence of others but is working on a task with them? Research indicates that their impact changes slightly (Sanna, 1992). When a group performs a task, it is not always possible to identify each individual's contributions. In these situations, people often exert less effort than when performing alone, a phenomenon termed **social loafing** (Karau & Williams, 1993, 1995). Whether the task is pulling on a rope, clapping as loudly as possible, or trying to solve intellectual puzzles, people tend to work harder when performing alone than with others (Baron, Kerr & Miller, 1992; Green, 1991). Steven Karau and Kipling Williams (1993) have proposed that social loafing occurs for two reasons: first, because rewards may come whether or not one exerts maximum effort, and, second, because rewards will be divided among the members of the group. A review of experiments on social loafing shows that it occurs more often among men than women in Western cultures, and that it is much less likely among people of either gender in cultures such as China and Japan (Smith & Bond, 1993). These differences probably reflect the collectivist orientation, which tends to be associated not only with women but also with people from Eastern cultures. This orientation emphasizes the importance of group performance and discourages social loafing.

In Western countries, social loafing can be seen in groups of all sorts, from volunteer committees to search parties. Because social loafing can reduce productivity in business situations, it is important for managers to develop ways of evaluating the efforts of every individual in a work group, not just the overall output of a team (Robbins, 1995).

social impairment A reduction in performance due to the presence of other people.

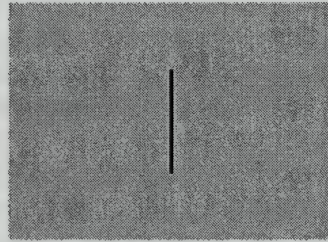
social loafing Exerting less effort when performing a group task because one's contribution cannot be identified.

Conformity and Compliance

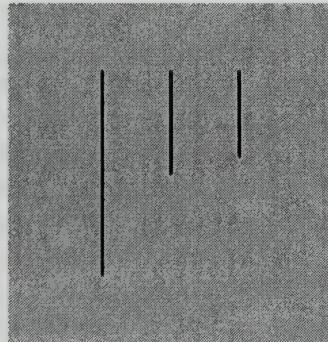
Suppose you are with three friends. One says that Franklin Roosevelt was the greatest president in the history of the United States. You think that the greatest president was Abraham Lincoln, but before you can say anything, another friend agrees that it was Roosevelt, and then the other one does as well. What would you do? Disagree with all three? Maintain your opinion but keep quiet? Change your mind?

When people change their behavior or beliefs to match those of other members of a group, they are said to conform. **Conformity** occurs as a result of *unspoken* group pressure, real or imagined (Turner, 1991). You probably have experienced such group pressure when everyone around you stands to applaud a performance you thought was not that great. You may conform by standing as well, though no one told you to do so; the group's behavior creates a silent but influential pressure to follow suit. **Compliance**, in contrast, occurs when people adjust their behavior because of a direct request, such as "Please pass the salt." When the last holdouts for conviction on a jury give in to other jurors' browbeating, they have complied with overt social pressure.

Conformity and compliance are usually generated by a group's spoken or unspoken norms. In a classic experiment, Nuzaffer Sherif (1937) managed to chart the formation of a group norm by taking advantage of the perceptual illusion whereby a stationary point of light in a completely dark room appears to move. Estimates of this movement tend to stay the same over time, *if* the observer is alone in the room. But when Sherif tested several people at once, asking each person to say aloud how far the



(A) STANDARD LINE



(B) TEST LINES

Source: Asch, 1955.

FIGURE 14.6

Types of Stimulus Lines Used in Experiments by Asch

Subjects in Asch's experiments saw a new set of lines like these on each trial. Which line in (B) matches the one in (A)?

conformity Changing one's behavior or beliefs to match those of other group members, generally as a result of real or imagined, though unspoken, group pressure.

compliance Adjusting one's behavior to match that of a group because of a direct request.

light moved on repeated trials, their estimates tended to converge; they had established a group norm. Even more important, when the individuals from the group were later tested alone, they continued to be influenced by this norm.

In another classic experiment, Solomon Asch (1956) examined how people would respond when they faced a norm that was obviously wrong. The participants in this experiment saw a standard link like the one in Figure 14.6(A); then they saw a display like that in Figure 14.6(B). Their task was to pick out the line in the display that was the same length as the one they had first been shown.

Each participant performed this task in a small group of people who posed as fellow participants, but who were actually working for the experimenter. There were two conditions. In the control condition, the real participant responded first. In the experimental condition, the participant did not respond until after the other people did. The experimenter's assistants chose the correct response on six trials, but on the other twelve trials they all gave the same, obviously incorrect, response. So, on twelve trials, each participant was confronted with a "social reality" created by a group norm that conflicted with the physical reality created by what the person could clearly see. Only 5 percent of the participants in the control condition ever made a mistake on this easy perceptual task. However, among participants who heard the others' responses before giving their own, about 70 percent made at least one error by conforming to the group norm. A recent analysis of one hundred thirty-three studies conducted in seventeen countries reveals that conformity in Asch-type situations has declined somewhat in the United States since the 1950s, but that it still occurs. It is especially likely in collectivist cultures, where conformity to group norms is emphasized (Bond & Smith, 1996).

Why Do People Conform? Why did so many people in Asch's experiment give incorrect responses when they were capable of near-perfect performance? One possibility, called *public conformity*, is that they gave an answer they did not believe in simply because it was the socially desirable thing to do. Another possibility is called *private acceptance*, meaning that the participants used the other people's responses as legitimate evidence about reality, were convinced that their own perceptions were wrong, and actually changed their minds. Morton Deutsch and Harold Gerard (1955) reasoned that if conformity disappeared when people gave their responses without identifying themselves, then Asch's findings must reflect public conformity, not private acceptance. In fact, conformity does decrease when people respond anonymously instead of publicly, but it is not eliminated (Deutsch & Gerard, 1955). People sometimes publicly produce responses that they do not believe in, but hearing other people's responses also influences their private beliefs (Moscovici, 1985).

Why are group norms so powerful? Research suggests three influential factors (Baron & Byrne, 1994). First, people are motivated to be correct, and norms provide information about what is right and wrong. This factor may help explain why some extremely disturbed or distressed people consider stories about suicide to be "social proof" that self-destruction is a reasonable way out of their problems (Cialdini, 1993). Second, people want to be liked by other group members. Finally, norms guide the distribution of social reward and punishment (Cialdini, 1995; Turner, 1991). From childhood on, people in many cultures learn that going along with group norms is a good

and earns rewards. These positive outcomes presumably help compensate for not always saying or doing exactly what we please. People also learn that breaking a norm may bring punishments ranging from scoldings for small transgressions to imprisonment for violation of norms that have been translated into laws.

When Do People Conform Clearly, people do not always conform to group influence. In the Asch studies, for example, nearly 30 percent of the participants did not go along with the assistants' obviously wrong judgments. Countless experiments have probed the question of what combinations of people and circumstances do and do not lead to conformity.

Ambiguity, for example, is very important in determining how much conformity will occur. As the physical reality of a situation becomes less certain, people rely more and more on others' opinions and conformity to a group norm becomes increasingly likely (Aronson, Wilson & Akert, 1997). You can demonstrate this aspect of conformity on any street corner. First, create an ambiguous situation by having several people look at the sky or the top of a building. When passers-by ask what is going on, be sure everyone excitedly reports seeing something interesting but fleeting—perhaps a faint light or a tiny, shiny object. If you are especially successful, conforming newcomers will begin persuading other passers-by that there is something fascinating to be seen.

On the other hand, if ambiguity contributes so much to conformity, why did so many of Asch's participants conform to a judgment that was clearly wrong? The answer has to do with the *unanimity* of the group's judgment and the *size of the majority* expressing it. Specifically, people experience great pressure to conform as long as the majority is unanimous. If even one other person in the group disagrees with the majority view, conformity drops greatly. For example, when Asch (1951) arranged for just one assistant to disagree with the others, fewer than 10 percent of the real participants conformed. Once unanimity is broken, it becomes much easier to disagree with the majority, even if the other nonconformist does not agree with the person's own view (Turner, 1991). Conformity also depends on the size of the majority. Asch (1955) demonstrated this phenomenon by varying the number of assistants in the group from one to fifteen. Conformity to incorrect norms grew as the number of people in the group increased. However, most of the growth in conformity occurred as the size of the majority rose from one to about three or four members; further additions had little effect.

Gender has also been studied as a factor influencing conformity. Early research on conformity suggested that women conform more than men, but this difference stemmed mainly from the fact that the tasks used in those experiments were often more familiar to men than to women. And, indeed, people are especially likely to conform when they are faced with an unfamiliar situation (Levine & Moreland, 1995). However, no male-female differences in conformity have been found in subsequent research using materials that are equally familiar to both genders (Maupin & Fisher, 1989). Why do some people still perceive women as more conforming than men despite evidence to the contrary? Part of the answer may lie in their perception of the relative social status of males and females. Those who think of women as having lower social status than men in most social situations are likely to see females as easier to influence, even though men and women conform equally often (Eagly, 1987).

Inducing Compliance In the experiments just described, the participants experienced psychological pressure to conform to the views or actions of others, even though no one specifically asked them to do so. In contrast, *compliance* involves changing what you say or do because of a direct request. How is compliance brought about? Many people believe that the direct approach is always best: If you want something, ask for it. But salespeople, political strategists, social psychologists, and other experts have learned that often the best way to get something is to ask for something else. Three examples of this strategy are the foot-in-the-door technique, the door-in-the-face procedure, and the low-ball approach.

The *foot-in-the-door technique* consists of getting a person to agree to small requests and then working up to larger ones. In the original experiment on this strategy, homeowners were asked to do one of two things. Some were asked to allow a large, unattractive “Drive Carefully” sign to be placed on their front lawn. Approximately 17 percent of the people approached in this way complied with the request. In the foot-in-the-door condition, however, homeowners were first asked only to sign a petition supporting laws aimed at reducing traffic accidents. Several weeks later when a different person asked these same homeowners to put the “Drive Carefully” sign on their lawn, 55 percent of them complied (Freedman & Frasher, 1966).

Why should the granting of small favors lead to larger ones? First, people are usually far more likely to comply with a request that costs little in time, money, effort, or inconvenience. Second, complying with a small request makes people think of themselves as being committed to the cause or issue (Cialdini, 1995). In the study just described, participants who signed the petition might have thought “I must care enough about traffic safety to do something about it.” Compliance with the higher-cost request (displaying the sign) increased because it was consistent with these people’s self-perceptions and past actions (Eisenberg et al., 1987).

The foot-in-the-door technique can be very effective. Steven Sherman (1980) created a 700 percent increase in the rate at which people volunteered to work for a charity simply by first getting them to say that, in a hypothetical situation, they would volunteer if asked. For some businesses, the foot-in-the-door is a request that potential customers merely answer a few questions; the request to buy something comes later. Others offer a small gift, or “door-opener,” as salespeople call it. Acceptance of the gift not only gives the salesperson a “foot in the door” but may also invoke the reciprocity norm: Many people who get something free feel obligated to reciprocate by buying something (Cialdini, 1993).

The second approach, known as the *door-in-the-face procedure*, also effectively obtains compliance (Cialdini, 1995; Reeves et al., 1991). This strategy begins with a request for a favor that is likely to be denied. The person making the request then concedes that asking for the initial favor was excessive and substitutes a lesser alternative—which is what he or she really wanted in the first place! Because the person appears willing to compromise, and because the new request seems modest in comparison to the first one, it is more likely to be granted than if it had been made at the outset. The door-in-the-face strategy is at the heart of bargaining among political groups and between labor and management.

The third technique, called the *low-ball approach*, is commonly used by car dealers and other businesses (Cialdini, 1993). The first step in this strategy is to get a person's oral commitment to do something, such as to purchase a car at a certain price. Once this commitment is made, the cost of fulfilling it is increased, often because of an "error" in computing the car's price. Why do buyers end up paying much more than originally planned for "low-balled" items? Apparently, once people commit themselves to do something, they feel obligated to follow through, especially when the person who obtains the initial commitment also makes the higher-cost request (Burger & Petty, 1981).

Obedience

■ How can someone make you do something you don't want to do?

Compliance involves a change in behavior in response to an explicit request. In the case of **obedience**, the behavior change comes in response to a *demand* from an authority figure (Kelman & Hamilton, 1989). In the 1960s Stanley Milgram developed a laboratory procedure to study obedience. In his first experiment he used newspaper ads to recruit forty male volunteers between the ages of twenty and fifty from the local community. Among the participants were professionals, white-collar businessmen, and unskilled workers (Milgram, 1963).

Imagine you are one of the people who answered the ad. When you arrive for the experiment, you join a fifty-year-old gentleman who has also volunteered and has been scheduled for the same session. The experimenter explains that the purpose of the experiment is to examine the effects of punishment on learning. One of you—the "teacher"—will help the learner remember a list of words by administering electric shock whenever he makes a mistake. Then the experimenter turns to you and asks you to draw one of two cards out of a hat. Your card says "TEACHER." You think to yourself that this must be your lucky day.

Now the learner is taken into another room and strapped into a chair. Electrodes are attached to his arm. You are shown a shock generator with thirty switches. The experimenter explains that the switch on the far left administers a mild, 15-volt shock and that each succeeding switch increases the shock by 15 volts. The one on the far right delivers 450 volts. The far left section of the shock generator is labeled "Slight shock." Looking across the panel, you see "Moderate shock," "Very strong shock," and, at the far right, "Danger—severe shock." The last two switches are ominously labeled "XXX." The experimenter explains that you, the teacher, will begin by reading a list of word pairs to the learner. Then you will go through the list again, presenting just one word of each pair. The learner should indicate which word went with. After the first mistake, you are

obedience A form of compliance in which people comply with a demand from an authority figure.

to throw the switch to deliver 15 volts of shock. Each time the learner makes another mistake, you are to increase the shock by 15 volts.

You begin, following the experimenter's instructions. But after the learner makes his fifth mistake and you throw the switch to give him 75 volts, you hear a loud moan. At 90 volts, the learner cries out in pain. At 150 volts, he screams and asks to be let out of the experiment. You look to the experimenter, who says, "Proceed with the next word."

In fact, no shock was delivered in Milgram's experiments. The "learner" was always an employee of the experimenter, and the moans and other sounds of pain came from a prerecorded tape. But you do not know that. What would you do in this situation? Suppose you continue and eventually deliver 180 volts. The learner screams that cannot stand the pain any longer and starts banging on the wall. The experimenter says, "You have no other choice; you must go on." Would you continue? Would you keep going even when the learner begged to be let out of the experiment and then fell silent? Would you administer 450 volts of potentially deadly shock to a perfect stranger just because an experimenter demands that you do so?

Only five participants in Milgram's experiment stopped before 300 volts, and twenty-six out of forty (65 percent) went all the way to the 450-volt level. The decision to continue was difficult and stressful for the participants. Many protested repeatedly. But each time the experimenter told them to continue, they did so. Here is a partial transcript of what a typical participant said.

[After throwing the 180-volt switch]: He can't stand it. I'm not going to kill that man in there. Do you hear him hollering? He's hollering. He can't stand it. What if something happens to him. I'm not going to get that man sick in there. He's hollering in there. Do you know what I mean? I mean, I refuse to take responsibility. He's getting hurt in there. . . . Too many left here. Geez, if he gets them wrong. There are too many of them left. I mean, who is going to take responsibility if anything happens to that gentleman?

[After the experimenter accepts responsibility]: All right. . . .

[After administering 240 volts]: Oh no, you mean I've got to keep going up the scale? No sir, I'm not going to kill that man. I'm not going to give him 450 volts.

[After the experimenter says, "The experiment requires that you go on"]: I know it does but that man is hollering in there, sir.

This participant administered shock up to 450 volts. (Milgram, 1974).

Factors Affecting Obedience

Milgram had not expected so many people to deliver such apparently intense shocks. Was there something about his procedure that produced this high level of obedience? To find out, Milgram and other researchers varied the original procedure in numerous ways. The overall level of obedience to an authority figure was usually quite high, but the degree of obedience was affected by several characteristics of the situation and procedure.

Prestige One possibility is that the experimenter's status as a Yale University professor helped produce high levels of obedience in Milgram's original experiment. To test the effects of status and prestige, Milgram rented an office in a run-down building in

Bridgeport, Connecticut. He then placed a newspaper ad for research sponsored by a private firm. There was no mention of Yale. In all other ways, the experimental procedure was identical to the original.

Under these less prestigious circumstances, the level of obedience dropped, but not as much as Milgram expected: 48 percent of the participants continued to the maximum level of shock, compared with 65 percent in the original study. Milgram concluded that people were willing to do great harm to another even if the authority figure was not particularly reputable or distinguished.

Presence of Others Who Disobey To assess how the presence of other people might affect obedience, Milgram (1965) created a situation in which there were three teachers. Teacher 1 (an employee of the experimenter) read the words to the learner. Teacher 2 (also an employee) indicated whether or not the learner's response was correct. Teacher 3 (the actual participant) delivered the shock when the learner made mistakes. At 150 volts, when the learner began to complain that the shock was too painful, Teacher 1 refused to participate any longer and left the room. The experimenter asked him to come back, but he refused. The experimenter then instructed Teachers 2 and 3 to continue by themselves. The experiment continued for several more trials. However, at 210 volts, Teacher 2 said that the learner was suffering too much and also refused to participate further. The experimenter then told Teacher 3 (the actual participant) to continue the procedure. In this case, only 10 percent of the participants (compared with 65 percent in the original study) continued to deliver shock all the way up to 450 volts. In line with the research on conformity, the presence of others who disobey appears to be the most powerful factor reducing obedience.

Personality Characters Were the participants in Milgram's original experiment heartless creatures who would have given strong shocks even if there had been no pressure on them to do so? Quite the opposite; most of them were nice people who were influenced by experimental situations to behave in apparently antisocial ways. In a later demonstration of the same phenomenon, college students playing the role of prison guards behaved with aggressive heartlessness toward other students playing the role of prisoners (Zimbardo, 1973).

Still, not everyone is equally obedient to authority. For example, people high in *authoritarianism* are more likely than others to comply with an experimenter's request to shock the learner. The same tends to be true of people who have an external *locus of control* (Blass, 1991). Such people believe that what happens to them is controlled by factors outside themselves.

Evaluating Milgram's Studies

Not long ago, two protesters of U.S. foreign policy lay down in front of a train to prevent it from delivering its cargo of military weapons. The train crew saw the men on the tracks, but, having been ordered not to stop, they did not even slow down. The train severed both legs of one protester, who forgave the crew because "they were following orders . . ." (Cialdini, 1993). Such incidents suggest that even though Milgram's studies were conducted more than thirty years ago, they are still relevant (Saks, 1992). Indeed,

his results have been replicated in several Western countries, with female as well as male participants (Smith & Bond, 1993). Other aspects of his work continue to be debated, however. (For a summary of Milgram's results, plus those of studies on conformity and compliance, see "In Review: Types of Social Influence.")

Questions About Ethics Although the "learners" in Milgram's experiment suffered no discomfort, the participants did. Milgram (1963) observed participants "sweat, stutter, tremble, groan, bite their lips, and dig their fingernails into their flesh" (p. 375). Against the potential harm inflicted by Milgram's experiments stand the potential gains. For example, people who learn about Milgram's work often take his findings into account when deciding how to react in social situations (Sherman, 1980). But even if social value has come from Milgram's studies, the question remains: Was it ethical for Milgram to treat his participants as he did?

In the years before his death in 1984, Milgram defended his experiments (e.g., Milgram, 1977). He argued that his debriefing of the participants after the experiment prevented any lasting harm. For example, he explained that the learner did not experience any shock; indeed, the learner came in and chatted with each participant. And on a later questionnaire, 84 percent of the participants said that they had learned something important about themselves and that the experience had been worthwhile. Thus, Mil-

LINKAGES Is it ethical to deceive people in order to learn about their social behavior? (a link to the Science of Psychology)

IN REVIEW Types of Social Influence		
Type	Definition	Key Findings
Conformity	A change in behavior or beliefs to match those of others	In cases of ambiguity, people develop a group norm and then adhere to it. Conformity occurs because people want to be right, because they want to be liked by others, and because conformity to group norms is usually reinforced. Conformity usually increases with the ambiguity of the situation, as well as with the unanimity and size of the majority.
Compliance	A change in behavior or beliefs because of a direct request	Compliance increases with the foot-in-the-door technique, which begins with a small request and works up to a larger one. The door-in-the-face procedure can also be used. After making a large request that is denied, the person substitutes a less extreme alternative that was desired all along. The low-ball approach also elicits compliance. An oral commitment for something is first obtained; then the person claims that only a higher-cost version of the original request will suffice.
Obedience	A change in behavior in response to an explicit demand, typically from an acknowledged authority figure	People may inflict great harm on others when an authority demands that they do so. Even when people obey orders to harm another person, they often agonize over the decision. People are most likely to disobey orders to harm someone else when they see another person disobey.

gram argued, the experience was actually a positive one. Still, today's committees charged with protecting human participants in research would be unlikely to approve Milgram's experiments, and less controversial ways to study obedience have now been developed (Sackoff & Weinstein, 1988).

Questions About Meaning Do Milgram's dramatic results mean that most people are putty in the hands of authority figures and that most of us would blindly follow inhumane orders from our leaders? Some critics have argued that Milgram's results cannot be interpreted in this way because his participants knew they were in an experiment and may simply have been playing a cooperative role (Orne & Holland, 1968). Most psychologists believe, however, that Milgram demonstrated a basic truth about human behavior—namely, that under certain circumstances people are capable of unspeakable acts of brutality toward other people. Sadly, examples abound. One of the most horrifying aspects of Nazi atrocities against the Jews—and of more recent attempts at genocide against ethnic groups in Eastern Europe and Africa—is that the perpetrators were not necessarily demented, sadistic fiends. Most of them were normal people who, because of the situation they faced, were influenced to behave in a demented and fiendish manner.

Worse, inhumanity can occur even without pressure to obey. For example, a good deal of people's aggressiveness toward other people appears to come from within. In the next section, we consider human aggression and some of the circumstances that influence its expression.

Aggression

■ What roles do genes play in shaping aggression?

Aggression is an action intended to harm another person (Baron & Richardson, 1994). It is all too common. For example, almost half of the dating couples interviewed in one study said that one of them had been physically aggressive toward the other (O'Leary, Malone & Tyree, 1994). There is less aggression among married couples, but not much less. About one-third of married people in the United States, display aggression toward each other that ranges from pushing, shoving, and slapping to beatings and the threatened or actual use of weapons (Pan, Neidig & O'Leary, 1994). Overall, more than 1.7 million violent crimes are committed each year in the United States, including more than 96,000 rapes and 20,000 murders (Federal Bureau of Investigation, 1997). Among black males and females between fifteen and twenty-four years of age, homicide is the leading cause of death; among whites in the same age range, homicide is the third leading cause of death, behind accidental death (first) and suicide (second) (U.S. Department of Justice, 1997). Surprisingly, over 50 percent of all murder victims knew their assailants—as family members, friends, or acquaintances (Federal Bureau of Investigation, 1997).

aggression An act that is intended to cause harm to another person.

Why Are People Aggressive?

Freud suggested that people have death instincts that account for human aggression toward others and themselves. Evolutionary psychologists believe that aggression helped prehistoric people compete for mates, thus ensuring survival of their genes in the next generation; through natural selection, then, aggressive tendencies are passed on through successive generations.

Freudian and evolutionary theories seem too simplistic to fully account for human aggressiveness, however. For one thing, there are large differences in aggression from culture to culture. The murder rate in the Philippines, for example, is forty-six times higher than in China or Finland, and almost nine times higher in the United States than in those later two countries (Triandis, 1994). These data suggest that, even if aggressive *impulses* are universal, the appearance of aggressive *behavior* reflects an interplay of nature and nurture (Lore & Schultz, 1993). No equation can predict when people will be aggressive, but years of research have revealed a number of important biological, learning, emotional, and environmental factors that combine in various ways to produce aggression in various situations.

Genetic and Biological Mechanisms

The evidence for hereditary influences on aggression is strong, especially in animals (Cairns, Garipey & Hood, 1990). In one study, the most aggressive members of a large group of mice were interbred; then, the most aggressive of their offspring were also interbred. After this procedure was followed for twenty-five generations, the resulting animals would immediately attack any mouse put in their cage. Continuous inbreeding of the least aggressive members of the original group produced animals that were so nonaggressive that they would refuse to fight even when attacked (Lagerspetz & Lagerspetz, 1983). Research on human twins reared together or apart suggests that there is a genetic component to aggression in people as well (Rushton et al., 1986; Tellegen et al., 1988). However, other research suggests that people do not necessarily inherit the tendency to be aggressive. Instead, they may inherit certain temperaments, such as impulsiveness, that in turn make aggression more likely (Baron & Richardson, 1994).

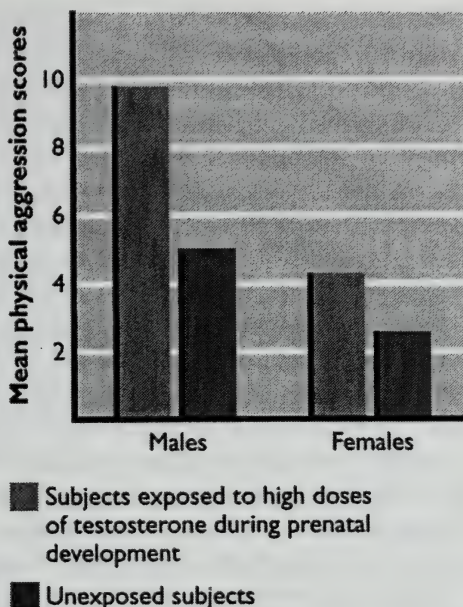
Several parts of the brain influence aggression (Fishbein, 1996). One of these is the limbic system, which includes the amygdala, the hypothalamus, and related areas. Damage to these structures may produce *defensive aggression*, which includes heightened aggressiveness to stimuli that are not usually threatening or a decrease in the responses that normally inhibit aggression (Coccaro, 1989; Eichelman, 1983). The prefrontal cortex may also be involved in aggression (Raine et al., 1997).

Hormones, too, play an important role in aggression. One possibility is that aggression is related to a person's level of *testosterone*, the masculine hormone that is present in both sexes (Bernhardt, 1997). Experiments have shown that aggressive behavior increases or decreases dramatically with the amount of testosterone in an animal's body (Frank, Glickman & Licht, 1991). Violent criminals appear to have higher levels of testosterone than nonviolent ones (Dabbs et al., 1995). And among normal men, varia-

LINKAGES Does human aggression have biological roots?
(a link to Social Psychology)

FIGURE 14.7**Testosterone and Aggression**

In the study illustrated here, the children of women who had taken testosterone during pregnancy to prevent miscarriage became more aggressive than the mothers' other children of the same sex who had not been exposed to testosterone during prenatal development. This effect held for both males and females.



Source: Data from Reinisch, Ziemba-Davis & Sanders, 1991.

tions in testosterone show a small but statistically significant correlation with aggressiveness (Dabbs & Morris, 1990; Gray, Jackson & McKinley, 1991).

Testosterone may have its most significant and durable influence through its impact on early brain development. One natural test of this hypothesis occurred when pregnant women were given testosterone in an attempt to prevent miscarriages. Accordingly, their children were exposed to high doses of testosterone during prenatal development. Figure 14.7 shows that these children grew up to be more aggressive than their same-sex siblings who were not exposed to testosterone during prenatal development (Reinisch, Ziemba-Davis & Sanders, 1991).

Drugs that affect the central nervous system also affect the likelihood that a person will act aggressively. Even relatively small amounts of alcohol, for example, can substantially increase some people's aggressiveness (Murphy & O'Farrell, 1996). One study demonstrated that when male alcoholics stopped drinking, the amount of violence directed toward their spouses decreased significantly (O'Farrell & Murphy, 1995). No one knows exactly why alcohol affects aggression, but research suggests that the drug may affect areas of the brain that normally inhibit aggressive responses (Lau, Pihl & Peterson, 1995).

Learning and Cultural Mechanisms Although biological factors may increase or decrease the likelihood of aggression, cross-cultural research makes it clear that learning also plays a role. Aggressive behavior is much more common in individuals than in collectivist cultures, for example (Oatley, 1993). And cultural differences in the expression of aggression appear to stem in part from differing cultural values (Cohen et al.,

1996). For example, the Utku (an Inuit culture) view aggression in any form as a sign of social incompetence. In fact, the Utku work for “aggressive” also means “childish” (Oatley, 1993). The effects of culture on aggression can likewise be seen in the fact that the incidence of aggression in a given culture changes over time as cultural values change (Baron & Richardson, 1994).

In addition, people learn many aggressive responses by watching others (Nietzel, Hasemann & Lynam, 1997). The most obvious examples are “copycat” crimes. More generally, children learn and perform many novel aggressive responses that they see modeled by others (Bandura, 1983). Bandura’s “Bobo doll” experiments provide impressive demonstrations of the power of observational learning. Its significance is underscored by studies of the effects of televised violence. For example, the amount of violent content watched on television by eight-year-olds predicts aggressiveness in these children even ten years later (Huesmann & Miller, 1994). Fortunately, not everyone who sees aggression becomes aggressive; individual differences in temperament, the modeling of nonaggressive behaviors by parents, and other factors can temper the effects of violent television. Nevertheless, observational learning does play a significant role in the development and display of aggressive behavior (Huesmann & Miller, 1994).

Immediate reward or punishment can also alter the frequency of aggressive acts. People become more aggressive when rewarded for aggressiveness and less aggressive when punished for aggression (Geen, 1990). In short, a person’s accumulated experiences, including culturally transmitted teachings, combine with daily rewards and punishments to influence whether, when, and how aggressive acts occur (Baron & Richardson, 1994).

When Are People Aggressive?

In general, people are more likely to be aggressive when they are both physiologically aroused and experiencing a strong emotion such as anger (Lang, 1993). People tend either to lash out at those who make them angry or to displace their anger onto children, pets, or other defenseless targets. However, aggression can also be made more likely by other forms of emotional arousal, especially *frustration*, which is a condition that occurs when obstacles block the fulfillment of goals.

Frustration and Aggression Suppose that a friend interrupts your studying for an exam by coming over to borrow a book. If things have been going well that day and you are feeling confident about the exam, you are likely to be friendly and accommodating. But what if you are feeling frustrated because your friend’s visit represents the fifth interruption in the last hour? Under these emotional circumstances, you may react aggressively, perhaps yelling at your startled visitor for not calling ahead (Eron, 1994).

Your aggressiveness in this situation conforms to the predictions of the **frustration-aggression hypothesis**, which was originally developed by John Dollard and his colleagues (Dollard et al., 1939). Research on this hypothesis showed that it was too simple

frustration-aggression hypothesis A proposition stating that the existence of frustration always leads to some form of aggressive behavior.

and too general, however. For one thing, frustration sometimes produces depression and withdrawal, not aggression (Baron & Richardson, 1994; Seligman, 1991). In addition, not all aggression is preceded by frustration (Berkowitz, 1994).

After many years of research, Leonard Berkowitz modified the frustration-aggression hypothesis in two ways. First, he suggested that frustration produces, not aggression, but a readiness to respond aggressively (Berkowitz, 1993). Once this readiness exists, cues in the environment that are associated with aggression will often lead a frustrated person to behave aggressively. The cues might be guns or knives, televised scenes of people arguing, and the like. Neither the frustration alone nor the cues alone are sufficient to set off aggression. When combined, however, they often do. Support for this aspect of Berkowitz's theory has been quite strong (Carlson, Marcus-Newhall & Miller, 1990).

Second, Berkowitz proposed that the more negative the emotion created by frustration, the stronger is the readiness to respond aggressively (Berkowitz, 1994). For example, unexpected failure at some task tends to create a more intense negative reaction than a failure that is expected. For this reason, aggression is more likely to occur following an unexpected failure than after an expected one. A number of experiments have supported this aspect of Berkowitz's theory as well (Finman & Berkowitz, 1989).

Generalized Arousal Imagine that you've just jogged three miles. You are hot, sweaty, and out of breath, but you are not angry. Still, the physiological arousal caused by jogging may increase the probability that you will become aggressive if, say, a passerby shouts an insult (Zillmann, 1988). Why? The answer lies in a phenomenon described in the chapter on motivation and emotion: Arousal from one experience may carry over to an independent situation, producing what is called *transferred excitation*. Thus, the physiological arousal caused by jogging may intensify your reaction to an insult (Geen, 1995).

By itself, however, arousal does not lead to aggression. It is most likely to produce aggression when the situation contains some reason, opportunity, or target for aggression (Zillman, 1988). In one study, for example, people engaged in two minutes of vigorous exercise. Then they had the opportunity to deliver electric shock to another person. The exercise increased the level of shock delivered only if the participants were first insulted (Zillman, Katcher & Milavsky, 1972). Apparently, the arousal resulting from the exercise made aggression more likely; the insult "released" it. These findings are in keeping with the notion suggested by learning theorists (and by Berkowitz in his revision of the frustration-aggression hypothesis) that aggression occurs not merely as a function of internal impulses or particular situations but as a result of the interaction of the two.

In both men and women, sexual stimulation produces strong, generalized physiological arousal, especially in the sympathetic nervous system. If arousal in general can make a person more likely to be aggressive (given a reason, opportunity, or target), could stimuli that create sexual excitement be dangerous?

THINKING CRITICALLY

**Does Pornography
Cause Aggression?**

In particular, does viewing pornographic material make people more likely to be aggressive? Over the years, numerous scholars concluded that there is no evidence for an overall relationship between any type of antisocial behavior and mere exposure to pornographic material (Donnerstein, 1984). However, in 1986 the U.S. Attorney General's Commission on Pornography reexamined the question and concluded that pornography is dangerous.

■ What am I being asked to believe or accept?

Specifically, the commission proposed that there is a causal link between viewing erotic material and several forms of antisocial behavior, including sexually related crimes.

■ Is there evidence available to support the claim?

The commission cited several types of evidence in support of its conclusion. First, there was the testimony of men convicted of sexually related crimes. Rapists, for example, are unusually heavy consumers of pornography, and they often say that they were aroused by erotic material immediately before committing a rape (Silbert & Pines, 1984). Similarly, child molesters often view child pornography immediately before committing their crimes (Marshall, 1989).

In addition, the commission cited experimental evidence that men who are most aroused by aggressive themes in pornography are also the most potentially sexually aggressive. One study, for example, showed that men who said they could commit a rape became sexually aroused by scenes of rape and less aroused by scenes of mutually consenting sex; this was not true for men who said they could never commit a rape (Malamuth & Check, 1983).

Perhaps the strongest evidence cited by the commission, however, came from transferred excitation studies. In a typical study of this type, people are told that a person in a separate room (actually an employee of the experimenter) will be performing a learning task and that they are to administer an electric shock every time the person makes a mistake. The intensity of shock can be varied (none actually reaches the employee), but participants are told that changing the intensity will not affect the speed of learning. So the shock intensity (and presumed pain) that they choose to administer is taken as an index of aggressive behavior. Some participants watch a sexually explicit film before beginning the learning trials, and the arousal created by the film appears to transfer into aggression (Donnerstein, 1984).

■ Can that evidence be interpreted another way?

The commission's interpretation of the evidence was faulted on several counts. First, critics argued that some of the evidence should be given little weight. In particular, how believable is the testimony of convicted sex offenders? It may reflect self-serving attempts to lay the blame for their crimes on pornography. These reports cannot establish that exposure to pornography causes aggression. Indeed, it may be that pornography partially *satisfies* sex offenders' aggressive impulses rather than creating them (Byrne & Kelley, 1989). Similarly, the fact that potential rapists are most aroused by

rape-oriented material may show only that they prefer violence-oriented pornography, not that such materials created their impulse to rape.

What about the evidence from transferred excitation studies? To interpret these studies, you need to know that the pornography that led to increased aggression contained violence as well as sex. The sexual activity depicted was painful for or unwanted by the woman. Thus, the subsequent increase in aggression could have been due to the transfer of sexual arousal, the effects of observing violent behavior, or the effects of seeing sex combined with violence (Donnerstein & Malamuth, 1997).

In fact, several careful experiments have found that highly arousing sexual themes, in and of themselves, do not produce aggression. When men in transferred excitation studies experience *pleasant* arousal by viewing a film depicting nudity or mutually consenting sexual activity, their subsequent aggression is actually less than when they viewed no film or a neutral film (Donnerstein, Linz & Penrod, 1987). In short, the transferred excitation studies might be interpreted as demonstrating that portrayals of sexual violence influence aggressiveness.

■ What evidence would help to evaluate the alternatives?

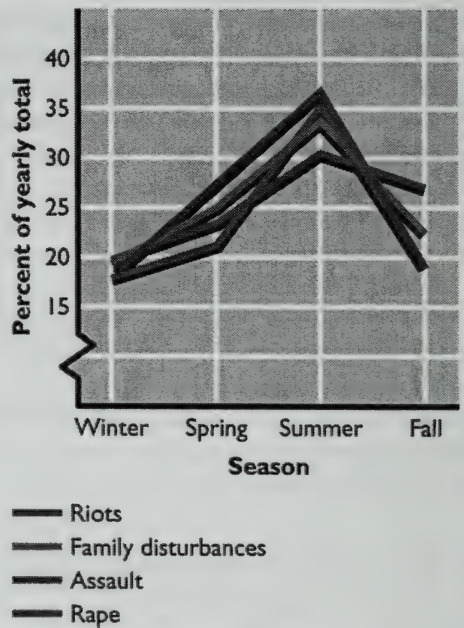
Two types of evidence are needed to understand more clearly the effects of pornography on aggression. First, since pornography can include sexual acts, aggressive acts, or both, the effects of each of these components must be more carefully examined (Hall & Hirschman, 1991). Second, factors affecting males' reactions to pornography, particularly pornography that involves violence, must be more clearly understood (Malamuth et al., 1991). Work has already begun on each of these fronts.

Whether specifically paired with sexual activity or not, aggressive themes do appear to increase subsequent aggression (Malamuth, Heavy & Linz, 1993). Research has focused on *aggressive pornography*, which contains sexual themes but also scenes of violence against women (Donnerstein & Malamuth, 1997). In laboratory experiments, males often administer larger amounts of shock to females after viewing aggressive pornographic films as compared to neutral films. Yet there is no parallel increase in aggression against other males, indicating that the films create not a generalized increase in aggression but an increase in aggressiveness directed toward women (Zillman & Weaver, 1989). Similarly, viewing aggressive pornography in which the victim appears aroused by the aggression usually leads males to become less sympathetic toward the rape victim and more tolerant of aggressive acts toward women (Donnerstein & Linz, 1995). Sexually explicit films that do not contain violence have no effects on attitudes toward rape (Linz, Donnerstein & Penrod, 1987).

In one study, 35 percent of all college men reported having been exposed to aggressive pornography within the last twelve months (Demare, Briere & Lips, 1988), and the figure may be even higher in the general population. Are all these men equally likely to become rapists? The evidence available so far suggests that the answer is no. Whether aggressive pornography alters men's behavior and attitudes toward women depends to some extent on the men. For example, men who are inclined to be sexually aggressive in general (not just toward women) show much greater sexual arousal in response to rape scenes than do less sexually aggressive men (Lohr, Adams & Davis, 1997; Malamuth et

FIGURE 14.8**Effects of Temperature on Aggression**

Studies of police reports reveal that rapes, assaults, family disturbances, and street riots are most likely to occur during the hottest days of the year.



Source: Anderson, 1989.

al., 1995). Further, the men most likely to act out the scenes of violence against women portrayed in aggressive pornography appear to be those who enjoy the domination of women and who feel anger toward women in general (Hall & Hirschman, 1994; Malamuth, 1988).

■ What conclusions are most reasonable?

The attorney general's commission appeared to ignore numerous studies showing that the relationship between sexual arousal and aggression is neither consistent nor simple (Baron & Richardson, 1994). Analysis of this relationship reveals the importance of distinguishing between pornography in general and aggressive pornography in particular. Overall, there is no reason to assume that sexual arousal created by nonaggressive pornography is associated with aggressive behavior. Indeed, for most people, sexual arousal and aggression remain quite separate.

Nevertheless, ample evidence suggests that aggressive pornography affects attitudes toward aggression, and that it may increase the likelihood of sexual violence in some viewers (Donnerstein, Slaby & Eron, 1995; Hall & Hirschman, 1994). Thus, there is reason for concern over the impact of sexual violence commonly seen on television and in films, especially "slasher" movies. Remarkably, such films are sometimes given less restrictive ratings ("R" or even "PG-13") than films that are nonviolent but erotic. It may be possible to blunt the impact of violent movies on viewers, but doing so will take time and money. In one study, Margaret Intons-Peterson and her colleagues (Intons-Peterson et al., 1989) gave men educational materials about rape and violence against

women just before they saw a “slasher” film. Instead of becoming more accepting of violence toward women, as is usually the case following the viewing of such material, these men became more concerned about the victims of sexual violence and the dangers of rape. The film’s usual effect *was* seen, however, in a control group of men who did not receive the educational materials.

Environmental Influences on Aggression The link between physiological arousal and the likelihood of aggressive behavior suggests that stressful environmental conditions can create enough arousal to make aggressive behavior more likely (Bell, 1992). This possibility is one of the research topics in **environmental psychology**, the study of the relationship between people’s physical environment and their behavior (Bell et al., 1996). One aspect of the environment that clearly affects social behavior is the weather, especially temperature. High temperatures are a source of stress; as Figure 14.8 indicates, aggression and violence are most likely to occur during the hottest days of summer (Anderson, Bushman & Groom, 1997).

Living arrangements also influence aggressiveness. Compared with the tenants of crowded apartment buildings, those in buildings with relatively few residents are less likely to behave aggressively (Bell et al., 1996). This difference appears to be due in part to how people feel when they are crowded. Crowding tends to create physiological arousal and to make people tense, uncomfortable, and more likely to report negative feelings (Oskamp & Schultz, 1998). This arousal and tension can influence people to like one another less and to be more aggressive. One study of juvenile delinquents found that the number of behavior problems they displayed (including aggressiveness) was directly related to how crowded their living conditions had become (Ray et al., 1982). Further, studies of prisons suggest that as crowding increases, so does aggression (Paulus, 1988). Accordingly, environmental psychologists are working with architects on the design of prisons that minimize the sense of crowding and, ideally, may help prevent some of the violence that endangers staff and prisoners.

Altruism and Helping Behavior

■ What motivates people to help?

Reginald Denny had the misfortune to be driving his truck through the center of the riots that broke out in Los Angeles, California in 1992. As his path was blocked by crowds, the camera aboard a local TV station’s helicopter broadcast live pictures of four men pulling him out of the truck and beating him mercilessly. Among the viewers were

environmental psychology The study of the effects of the physical environment on people’s behavior and mental processes.

two men and two women living in the riot area who, unlike thousands of their neighbors, left the safety of their homes to try to help Denny. Though threatened by Denny's attackers and the crowd, these four people got the severely injured trucker back into his vehicle and drove him to the hospital. Doctors there said that, had he arrived five minutes later, Reginald Denny would have died (Schroeder et al., 1995).

The actions of these individuals provide a dramatic example of another relatively common social behavior: people helping one another. **Helping behavior** is defined as any act that is intended to benefit another person. Helping can range from picking up dropped packages to donating a kidney. Closely related to helping is **altruism**, an unselfish concern for another's welfare (Batson, 1998). In the following sections we examine some of the reasons for helping and altruism, along with some of the conditions under which people are most likely to help others.

Why Do People Help?

The tendency to help others begins early, although at first it is not spontaneous. In most cultures, very young children generally help others only when they are asked to do so or are offered a reward (Grusec, 1991). Still, Carolyn Zahn-Waxler and her associates (1992) found that almost half of the two-year-olds they observed acted helpfully toward a friend or family member. Even before their second birthday, some children offer help to those who are hurt or crying by snuggling, patting, or offering food or even their own teddy bears. As they grow older, children use helping behavior to gain social approval, and their efforts at helping become more elaborate. The role of social influence in the development of helping is seen as children follow examples set by people around them. Their helping behaviors are shaped by the norms established by their families and the broader culture (Grusec & Goodnow, 1994). In addition, children are praised and given other rewards for helpfulness, but scolded for selfishness. Eventually children come to believe that being helpful is good and that they are good when they are helpful. By the late teens, people often help others even when no one is watching and no one will know that they did so (Cialdini, Baumann & Kenrick, 1981). There are three major theories about why people help even when they cannot expect any external rewards for doing so.

Arousal:Cost-Reward Theory The first of these—the **arousal:cost-reward theory**—has been invoked to explain actions like those of the people who saved Reginald Denny (Piliavin et al., 1981). This theory proposes that people find the sight of a victim distressing and anxiety-provoking, and that this experience motivates them to do something to reduce the unpleasant arousal. Indeed, several studies have shown that, all else being equal, the more physiologically aroused bystanders are, the more likely they are

helping behavior Any act that is intended to benefit another person.

altruism An unselfish concern for another's welfare.

arousal:cost-reward theory A theory that attributes helping behavior to people's efforts to reduce the unpleasant arousal they feel when confronted with a suffering victim.

to help someone in an emergency (Dovidio et al., 1991; Schroeder et al., 1995). Before rushing to a victim's aid, however, the bystander will first evaluate the costs associated with helping and the costs (to the bystander and the other person) of not helping. Whether or not the bystander actually helps depends on the outcome of this evaluation (Dovidio et al., 1991). If the costs of helping are low (as when helping someone pick up a dropped grocery bag) and the costs of not helping are high (as when the other person is physically unable to do this alone), the bystander will almost certainly help. However, if the costs of helping are high (as when helping to load a heavy air conditioner into a car) and the costs of not helping are low (because there are several others around who could help, for example), the bystander is unlikely to offer help.

It is more difficult for this theory to predict what the bystander will do when the cost of helping and the cost of not helping are *both* high. In that case, helping (or not helping) may depend on several situational factors and, sometimes, on the personality of the potential helper.

The *clarity of the need for help* has a major impact on whether others provide help (Dovidio et al., 1991). In one study, undergraduate students waiting alone in a campus building observed what appeared to be an accident involving a window washer. The man screamed as he and his ladder fell to the ground. Then he began to clutch his ankle and groan in pain. All of the students looked out of the window to see what had happened, but only 29 percent of them did anything to help. Other students experienced the same situation, but with an important difference. The man said he was hurt and needed help. In this case, more than 80 percent of the participants came to his aid (Yakimovich & Saltz, 1971). Apparently, this one additional cue eliminated any ambiguity in the situation and led the majority of people to offer their help.

The *presence of others* also has a strong influence on the tendency to help. Somewhat surprisingly, however, their presence may sometimes *inhibit* helping behavior. One of the most highly publicized examples of this phenomenon was the Kitty Genovese incident, which occurred on a New York City street on March 13, 1964. During a thirty-minute struggle, a man stabbed Ms. Genovese repeatedly. None of the dozens of neighbors who witnessed the attack intervened or even called the police until it was too late to save her life. Public dismay and disbelief followed. Psychologists wondered whether something about the situation that night had kept people from helping.

The numerous studies of helping behavior stimulated by this tragedy revealed the *bystander effect*: The more people there are who witness an emergency, the *less* likely it is that any one of them will help (Schroeder et al., 1995). One explanation for the inhibiting effect of others is that each person thinks someone else will help the victim. This tendency to deny any personal responsibility for helping when others are present is known as **diffusion of responsibility** (Schroeder et al., 1995). The degree to which the presence of other people will inhibit helping may depend on who those other people are. When they are strangers, perhaps poor communication inhibits helping. People

diffusion of responsibility The process through which a person takes no personal responsibility for helping someone in trouble because other potential helpers are present.

have difficulty speaking to strangers, particularly in an emergency; and without speaking, they have difficulty knowing what the others intend to do. According to such logic, if people are with friends rather than strangers, they should be less embarrassed, more willing to discuss the problem, and thus more likely to help.

In one experiment designed to test this idea, a female experimenter left a research participant in a waiting room, either alone, with a friend, with a stranger, or with a stranger who was an employee of the experimenter (Latané & Rodin, 1969). The experimenter then stepped behind a curtain into an office. For nearly five minutes, she could be heard opening and closing the drawers of her desk, shuffling papers, and so on. Then there was a loud crash, and she screamed, "Oh, my God. . . . My foot, I . . . I can't move it. Oh, my ankle. . . . I can't get this. . . thing off me." Then the participant heard her groan and cry.

Would the participant go behind the curtain to help? Once again, people were most likely to help if they were alone. When one other person was present, participants were more likely both to communicate with one another and to offer help if they were friends than if they were strangers. When the stranger was the experimenter's employee (who had been instructed not to help), very few participants offered to help. Other studies have confirmed that bystanders' tendency to help increases when they know each other (Rutkowski, Gruder & Romer, 1983).

Environmental factors can be important as well. Research conducted in several countries has revealed, for example, that people in urban areas are generally less helpful than those in rural areas (Bell et al., 1996; Hedge & Yousif, 1992; Steblay, 1987). Why? It is probably not the simple fact of living in a city but, rather, the stressors one finds there that tend to make some urban people less helpful. A study of helping in thirty-six U.S. cities found crowding to be the environmental stressor that most consistently influ-

IN REVIEW Helping Behavior

Possible Reasons People Help

Helping reduces unpleasant arousal, especially when the cost of helping is low.

Helping is triggered by empathy with those in need.

Our genetic heritage predisposes us to help.

When People Are Most Likely to Help

The need of the other person is recognized.

The environment is not filled with stressors.

Few others are present.

The others present are friends or acquaintances of the potential helper.

The potential helper has "helpful" traits.

enced helping (Levine et al., 1994). The higher the population per square mile, the less likely people were to help others. Two explanations have been suggested for this association between higher environmental stress and less helping. The first is that stressful environments create bad moods—and, generally speaking, people in a bad mood are relatively unlikely to help (Salovey, Mayer & Rosenhan, 1991). A second possibility is that noise, crowding, and other urban stressors create too much stimulation. To reduce this excessive stimulation, people may pay less attention to their surroundings, including individuals who need help.

Research also suggests that the *personality of the helper* may sometimes matter in determining who will help. Some people are just more likely to help than others. Consider, for example, the Christians who risked their lives to save Jews from the Nazi Holocaust. Samuel and Pearl Oliner (1988) interviewed over 200 of these rescuers and compared their personalities to those of people who had a chance to save Jews but did not do so. The rescuers were found to have more empathy (the ability to understand or experience another's emotional state) (Davis, 1994), more concern about others, a greater sense of responsibility for their own actions, and a greater sense of self-efficacy (confidence in the success of their efforts). Louis Penner and his associates (1995) found the same traits in college students who engage in other kinds of helping.

Empathy-Altruism Theory The second major approach to helping is embodied in the **empathy-altruism theory**, which maintains that people are more likely to engage in altruistic, or unselfish, helping—even at a high cost—if they feel empathy toward the person in need (Batson, 1998; Batson et al., 1997). In one experiment, students watched what they thought were live video images of a woman in great distress as she received a series of painful electric shocks (Batson et al., 1983). In actuality, they were viewing a videotape of an actress pretending to be shocked. Some students expressed great empathy for her, whereas others expressed very little empathy. The experimenter then asked the students if they would be willing to help the woman by taking her place for the remainder of the shock series. Half the participants were told they could leave immediately if they were not willing to be shocked. The other half were told that if they did not volunteer, they would still have to watch the woman getting the rest of her shocks. In this study, most people who expressed high empathy for the victim tended to help her, even when they could have refused and immediately left the situation. Those who felt little empathy tended to help only if they would have had to stay and watch the victim suffer. The helpers themselves did not actually receive any shock.

Were the helpers in this experiment being completely unselfish or was there a selfish component to their apparent altruism? Some studies suggest that people in such situations may help because doing so makes them feel good about themselves or relieves their sadness over another person's plight (Cialdini et al., 1987; Smith, Keating & Stotland, 1989). Although the final verdict on this question is not yet in, the evidence appears to support the contention that empathizing with another person can sometimes lead to unselfish helping (Dovidio, Allen & Schroeder, 1990).

empathy-altruism theory A theory suggesting that people help others because they feel empathy toward them.

Evolutionary Theory The evolutionary approach to social psychology views many social behaviors as echoes of actions that contributed to the survival of our prehistoric ancestors (Simpson & Kenrick, 1997). At first glance, it might not seem reasonable to apply evolutionary theory to helping and altruism, because helping others at the risk of our own well-being does not appear adaptive. If we die while trying to save others, it will be their genes, not ours, that will survive. Indeed, according to Darwin's concept of the "survival of the fittest," helpers—and their genes—should have disappeared long ago. Contemporary evolutionary theorists suggest, however, that Darwin's thinking about natural selection focused too much on the survival of the fittest *individuals* and not enough on the survival of their genes *in others*. Thus, survival of the fittest has been replaced by the concept of *inclusive fitness*, the survival of one's genes in future generations (Hamilton, 1964). Because we share genes with our relatives, helping or even dying for a cousin, a sibling, or, above all, our own child, potentially increases the likelihood that at least some of our genetic characteristics will be passed on to the next generation through the beneficiary's future reproduction (Buss, 1995). Thus, *kin selection*, helping a relative to survive, may produce genetic benefits for the helper.

There is considerable evidence that kin selection occurs among birds, squirrels, and other animals. The more closely the animals are related, the more likely they are to risk their lives for one another. Studies in a wide variety of cultures show the same pattern of helping among humans (Essock-Vitale & McGuire, 1985). For example, people in the United States are three times as likely to donate a kidney to a relative as to a nonrelative (Borgida, Conner & Monteufel, 1992).

Bear in mind, however, that even if evolutionary theory explains some general human tendencies to help, it cannot predict the behavior of specific individuals in specific situations (Hettema, 1993). Like all behavior, helping and altruism depend on the interplay of many genetic and environmental factors, including interactions between particular people and particular situations. (See "In Review: Helping Behavior" for a summary of the major reasons why people help and the conditions under which they are most likely to do so.)

Cooperation, Competition, and Conflict

Helping is one of the many ways in which people cooperate in order to accomplish their goals, but people also compete with others for limited resources. For example, several law students might form a study group to help one another pass the bar exam. But the same students might then compete with each other for a single job opening at a prestigious law firm. *Cooperation* is any type of behavior in which people work together to attain a goal. *Competition* exists whenever individuals try to attain a goal for themselves while denying that goal to others.

Competition can lead to *conflict*, including in the context of *social dilemmas*, which are situations—usually occurring in large communities—in which an action that is most rewarding for each individual will, if adopted by all, become catastrophic for everyone. For instance, it might be in a factory owner's self-interest to dump toxic waste into a river; but if all factories do the same, the environment will eventually become uninhabitable for everyone. Similarly, each person is financially better off by

refusing to donate to a publicly supported broadcasting system; but if everyone refuses to donate, no one will have access to its programs. Social dilemmas reflect inherent conflicts between the interests of the individual and those of the group and between short-term and long-term interests (Schroeder, 1995).

Election campaigns, lawsuits over a deceased relative's estate, and competition between children for a coveted toy are all examples of situations that lead to *interpersonal conflict*, a process of social dispute in which one person believes that another stands in the way of something of value. One might think that people from collectivist cultures (which emphasize cooperation) would be less likely to act competitively or selfishly in social dilemmas. This may be true in general, but conflict in such situations does appear in all cultures (Smith & Bond, 1993).

Group Processes

■ What factors influence leadership effectiveness?

Although Western industrialized cultures tend to emphasize individuals over groups, the fact remains that most important decisions and efforts by governments and businesses in those cultures and elsewhere are made by groups, not individuals. Sometimes group processes are effective, as when a team of doctors, nurses, specialists, and two parents brought the McCaughey septuplets into the world on November 19, 1997. At other times, they can have disastrous results, as we will see later.

In the chapter on thought and language, we describe some of the factors—such as the size of the group, the status of its various members, and the order in which options are considered—that influence the nature and quality of group decisions. Here, we consider some of the social psychological processes that often occur in groups to alter the behavior of their members and the quality of their collective efforts.

Group Leadership

Whereas a good leader can help a group pursue its goals, a poor one can get in the way of a group's functioning. What makes a good leader? Early research suggested that the personalities of good and bad leaders were about the same, but we now know that certain personality traits often distinguish effective from ineffective leaders. For example, using tests similar to those that measure the "big five" traits, Robert Hogan and his colleagues (1994) found that effective leaders tend to score high on dominance, emotional stability, agreeableness, and conscientiousness. Other researchers have found that, in general, effective leaders are intelligent, success-oriented, and flexible (Levine & Moreland, 1995).

Having particular personality traits does not guarantee good leadership ability, however. People who are effective leaders in one situation may be ineffective in another (Yukl & Van Fleet, 1992). The reason is that effective leadership also depends on the characteristics of the group members, the task at hand, and, most important, the interaction between these factors and the leader's style.

Two main styles of leadership have been identified. **Task-oriented** leaders provide very close supervision, lead by giving orders, and generally discourage group discussion (Yukl & Van Fleet, 1992). Their style may make them unpopular. In contrast, **person-oriented** leaders provide loose supervision, ask for group members' ideas, and are generally concerned with subordinates' feelings. They are usually well liked by the group, even when they must discipline someone (Boyatzis, 1982).

Research on leadership effectiveness and gender provides one explanation as to why one leadership style is not invariably better than another. According to Alice Eagly and her associates, men and women in Western cultures tend to have different leadership styles (Eagly & Johnson, 1990; Eagly, Karau & Makhijani, 1995). Overall, men and women are equally capable leaders, but men tend to be more effective when success requires a more task-oriented leader and women are more effective when success requires a more person-oriented leader. One interpretation of these differences is that gender-role learning processes described in Chapter 10 lead men and women to "specialize" in different leadership behaviors. This may be one reason some people do not like female leaders who act in a "masculine" manner or occupy leadership positions traditionally held by men. In certain circumstances, such responses create bias against women leaders, particularly among male members of the groups they lead (Eagly, Makhijani & Klonsky, 1992).

Most contemporary theories of leadership are known as *contingency* theories (Schreisheim, Tepper & Tetrault, 1994), because they suggest that leadership effectiveness is contingent, or depends, on factors such as the leader's relations with group members and the nature of the group's task. They note, for example, that task-oriented leaders tend to be most effective when the group is working under time pressure, when the task is unstructured, and when circumstances make it unclear as to what needs to be done first and how duties should be divided. People stranded in an elevator in a burning building, for example, need a task-oriented leader. Conversely, person-oriented leaders tend to be most effective when the task is structured and there are no severe time limitations (Chemers, 1987). These people would be particularly successful, for example, in managing an office in which the workers know their jobs well.

Groupthink

The emphasis on group decisions in most large organizations is based on the belief that a group of people working together will make better decisions than will individuals working alone. This belief is generally correct; yet, under certain circumstances, groups have been known to make amazingly bad decisions (Levine & Moreland, 1995). Consider two examples. First, in the late 1930s, U.S. government leaders decided not to take special precautions to defend Hawaii's Pearl Harbor. The Japanese attack there on

task-oriented Referring to a leadership style in which the leader provides close supervision, leads by giving directions, and generally discourages group discussion.

person-oriented Referring to a leadership style in which the leader provides loose supervision, asks for group members' ideas, and is generally concerned with subordinates' feelings.

December 7, 1941, killed 2,500 people. Second, in 1986, NASA administrators ignored engineers' warnings about the effects of cold weather and decided to launch the space shuttle *Challenger*. The spacecraft exploded seventy-three seconds after liftoff, killing all aboard. After analyzing these and other disastrous governmental decisions, Irving Janis (1989) proposed that they can be attributed to a phenomenon called **groupthink**. Groupthink occurs, he said, when group members are unable to realistically evaluate the options available to them or to fully consider the potential negative consequences of a contemplated decision.

Groupthink is particularly likely when three conditions exist: (1) the group is isolated from outside influences (Turner et al., 1992); (2) the group is working under time pressure or other intense stressors (Worchel & Shackelford, 1991); and (3) the leader is not impartial. This last condition appeared to play a crucial role in President Kennedy's decision to support a disastrously unsuccessful invasion of Cuba by anti-Castro Cubans in 1961. Before the final decision was made, several advisers were told that Kennedy had made up his mind and it was time to "close ranks with the president." This situation created enormous pressure for conformity (May & Zelikow, 1997).

LINKAGES How does stress affect group decision making? (a link to Health, Stress, and Coping)

When these three conditions exist, groups tend to become close-minded and to rationalize their decision as the only reasonable one. They dismiss other options and quickly suppress any dissenting voices. As a result, the group becomes more and more certain that its decision cannot possibly be wrong. Although some researchers have questioned the prevalence and dangers of groupthink (Aldag & Fuller, 1993), most researchers agree that it does occur, at least under conditions similar to those originally identified by Janis (Baron, Kerr & Miller, 1992). Some psychologists have worked on developing techniques to help groups avoid groupthink. One is to designate someone to play the "devil's advocate," who constantly challenges the group's emerging decisions and offers alternatives (Janis, 1989). Another is to encourage the expression of diverse opinions by making them anonymous. Group members might sit at separate computers and type out all the options that occur to them. Each option is displayed for all to see on an e-mail system that hides the sender's identity; the group then discusses the options through e-mail without knowing who is saying what. Research on this procedure suggests that it is effective in stimulating logical debate and making people less inhibited about disagreeing with the group (O'Brien, 1991).

groupthink A pattern of thinking that, over time, renders group members unable to evaluate realistically the wisdom of various options and decisions.

ACTIVE REVIEW

Social Psychology

Summary

Social cognition, the mental processes through which people perceive and react to others, is one aspect of *social psychology*, the study of how people influence and are influenced by other people. Through social cognition, each person creates a unique perception of reality.

SOCIAL CONSTRUCTION OF THE SELF

■ How do I compare myself to others and protect my self-esteem?

People's social and cultural environments affect their thoughts and feelings about themselves, including their *self-esteem* and their *self-concept*. When people have no objective criteria by which to judge themselves, they look to others as the basis for *social comparison*. Such comparison can affect self-evaluation, or self-esteem. Categories of people that are habitually used for social comparison are known as *reference groups*. Comparison to reference groups sometimes produces *relative deprivation*, which, in turn, can cause personal and social turmoil.

A person's *social identity* is formed from beliefs about the groups to which the person belongs. Social identity affects the beliefs we hold about ourselves, our self-concept. Social identity permits people to feel part of a larger group, engendering loyalty and sacrifice from group members, but also potentially creating bias and discrimination toward people who are not members of the group.

SOCIAL PERCEPTION

■ How do we form first impressions?

Social perception concerns the processes by which people interpret information about others, form impressions of them, and draw conclusions about the reasons for their behavior. Schemas, the mental representations about people and social situations that we carry into social interactions, affect what we pay attention to, what we remember, and how we judge people and events.

First impressions are formed easily and quickly, in part because people apply existing schemas to their perceptions of others. First impressions change slowly because people are "cognitive misers"; once we form an impression about another person, we try to maintain it because doing so simplifies the world. Schemas, however, can create *self-fulfilling prophecies*, leading us to act in ways that bring out behavior in others that is consistent with our first impressions of them.

Attribution is the process of explaining the causes of people's behavior, including our own. Observers tend to attribute behavior to causes that are either internal or external to the actor. People from different cultures may sometimes reach different conclusions about the causes of a given behavior. Attributions are also affected by biases that systematically distort one's view of behavior. The most common attributional biases are the *fundamental attribution error* (and its cousin, the ultimate attribution error), the *actor-observer bias*, and the *self-serving bias*. Personal and cultural factors can affect the extent to which people exhibit attributional biases.

ATTITUDES

■ How do our attitudes affect our behavior?

An *attitude* is the tendency to respond positively or negatively to a particular object. Attitudes affect a wide range of behaviors. Some theorists believe that attitudes have three components: cognitive (beliefs), affective (feelings), and behavioral (actions). However, it is often difficult to predict a specific behavior from a person's beliefs or feelings about an object. Cognitive theories suggest that the likelihood of attitude-behavior consistency depends on subjective norms, perceived control over the behavior, prior direct experience with the attitude object, and how closely people monitor the behavior of others.

Attitudes can be learned through modeling as well as through classical or operant conditioning. They are also subject to the mere-exposure effect: All else being equal, people develop greater liking for a new object the more often they are exposed to it.

The effectiveness of a persuasive message in changing attitudes is influenced by the characteristics of the person who communicates it, by its content, and by the audience receiving it. The *elaboration likelihood model* suggests that attitude change can occur via either the peripheral or the central route, depending on a person's ability and motivation to carefully consider an argument. Accordingly, different messages will produce attitude change under different circumstances. Another approach is to change a person's behavior, in the hope that his or her attitude will be adjusted to match the behavior. *Cognitive dissonance theory* holds that inconsistency between cognitions about attitudes and cognitions about behavior creates discomfort that often results in tension-reducing attitude change.

PREJUDICE AND STEREOTYPES

■ How does prejudice develop?

Stereotypes often lead to *prejudice* and *discrimination*. Motivational theories of prejudice suggest that some people have a need to dislike people who differ from them. This need may stem from an authoritarian personality, as well as from a strong social identity. In either case, feeling superior to members of out-groups helps these people to feel better about themselves. As a result, in-group members tend to discriminate against out-groups. Cognitive theories suggest that people categorize others into groups in order to reduce social complexity. Learning theories maintain that stereotypes, prejudice, and discriminatory behaviors can be learned from parents, peers, and the media. The *contact hypothesis* proposes that intergroup contact can reduce prejudice and lead to more favorable attitudes toward the stereotyped group—but only if it occurs under specific conditions, such as equal status between groups.

INTERPERSONAL ATTRACTION

■ What factors influence who likes whom?

Interpersonal attraction is a function of many variables. Physical proximity is important because it allows people to meet. The situation in which they meet is important because positive or negative aspects of the situation tend to be associated with the other person. Characteristics of the other person are also important. Attraction tends to be greater when two people share similar attitudes and personal characteristics. Physical appearance plays a role in attraction; initially, attraction is strongest to those who are most physically attractive. But for long-term relationships, the *matching hypothesis* applies: People tend to choose others whose physical attractiveness is about the same as theirs.

A defining characteristic of intimate relationships is interdependence. The most important ingredients of such relationships are affection and emotional expressiveness, which in turn often lead to social support, cohesiveness, and sexuality. Sternberg's triangular theory suggests that love is a function of three components: passion, intimacy, and commitment. Varying combinations of these three components create qualitatively different types of love. Marital satisfaction depends on communication, the perception that the relationship is equitable, and the couple's ability to deal effectively with conflict and anger.

SOCIAL INFLUENCE

■ How does social pressure get people to conform?

Norms establish the rules for what should and should not be done in a particular situation. One particularly powerful norm is reciprocity, the tendency to respond to others as they have acted toward you. *Deindividuation* is a psychological state in which people temporarily lose their individuality, their normal inhibitions are relaxed, and they may perform aggressive or illegal acts that they would not do otherwise.

When behavior or beliefs change as the result of unspoken or implicit group pressure, *conformity* has occurred; when the change is the result of a direct request, *compliance* has occurred. People tend to follow the normative responses of others, and groups create norms when none already exist. People sometimes exhibit public conformity without private acceptance; at other times, the responses of others have a genuine impact on private beliefs. People conform because they want to be right, because they want to be liked, and because they tend to be rewarded for doing so. People are most likely to conform when the situation is ambiguous, as well as when others in the group are in unanimous agreement. Up to a point, conformity usually increases as the number of people holding the majority view grows larger. Effective strategies for inducing compliance include the foot-in-the-door technique, the door-in-the-face procedure, and the low-ball approach.

LINKAGES: MOTIVATION AND THE PRESENCE OF OTHERS

A person's motivational state is affected by the presence of other people. By enhancing one's most likely behavior in a situation, other people sometimes create *social facilitation*, which improves performance, and sometimes create *social impairment*, which interferes with it. When people work in groups, they often exert less effort than when alone, a phenomenon termed *social loafing*.

OBEDIENCE

■ How can someone make you do something you don't want to do?

Obedience involves complying with an explicit demand, typically from an authority figure. Research by Stanley Milgram indicates that levels of obedience are high even when obeying an authority appears to result in pain and suffering for another person. Obedience declines when the status of the authority figure declines, as well as when others are observed to disobey. Some people may be more likely to obey orders than others. Because participants in Milgram's studies experienced considerable stress, the experiments have been questioned on ethical grounds. Nevertheless, his research showed that people do not have to be psychologically disordered to inflict pain on others.

AGGRESSION

■ What role do genes play in shaping aggression?

Aggression is an act intended to harm another person. Freud saw aggression as due partly to death instincts. More recent theories attribute aggressive tendencies to genetic factors, brain dysfunctions, and hormonal influences. Learning is also important; people learn to display aggression by watching others and by being rewarded for aggressive behavior. There are wide cultural differences in the incidence of aggression.

A variety of emotional factors play a role in aggression. The *frustration-aggression hypothesis* suggests that frustration can lead to aggression, particularly if cues that invite or promote aggression are present. Arousal from sources unrelated to aggression, such as exercise, can also make aggressive responses more likely, especially if aggression is already a dominant response in that situation. Research in *environmental psychology* suggests that factors such as high temperature and crowding increase the likelihood of aggressive behavior, particularly among people who are already angry.

ALTRUISM AND HELPING BEHAVIOR

■ What motivates people to help?

Humans are also characterized by *helping behavior* and *altruism*. There are three major theories of why people help others. According to the *arousal: cost-reward theory*, people help in order to reduce the unpleasant arousal they experience when others are in distress. Their specific reaction to a suffering person depends on the costs associated with helping or not helping. Helping behavior is most likely when the need for help is clear, and when *diffusion of responsibility* is not created by the presence of other people. Environmental and personality factors also affect willingness to help. The *empathy-altruism theory* suggests that helping can be truly unselfish if the helper feels empathy for the person in need. Finally, evolutionary theory suggests that humans have an innate tendency to help others, especially relatives, because doing so increases the likelihood that family genes will survive.

Cooperation is any type of behavior in which people work together to attain a goal; competition exists whenever individuals try to attain a goal for themselves while denying that goal to others. Psychologists study conflict by observing behavior in social dilemmas, situations in which selfish behavior that benefits individuals in the short run may spell disaster for the entire group in the long run. Interpersonal conflict is a process of social dispute in which one person believes that another stands in the way of something of value.

GROUP PROCESSES

■ What factors influence leadership effectiveness?

According to Robert Hogan and his colleagues, effective leaders tend to score high on dominance, emotional stability, agreeableness, and conscientiousness. Other researchers have found that, in general, effective leaders are intelligent, success-oriented, and flexible. *Task-oriented* leaders provide close supervision, lead by giving orders, and generally discourage group discussion. In contrast, *person-oriented* leaders provide loose supervision, ask for group members' ideas, and are generally concerned with subordinates' feelings. Overall, men and women are equally capable leaders, but men tend to be more effective when success requires a more task-oriented leader and women are more effective when success requires a more person-oriented leader.

Groupthink occurs when group members are unable to realistically evaluate the options available to them or to fully consider the potential negative consequences of a contemplated decision. This pattern of thinking is most likely to occur when a group is isolated from outside forces, when it is working under time pressure or other intense stressors, and when it lacks a truly impartial leader.

To Learn More

Courses

To learn more about social psychology, take:

Social Psychology
Social Conflict
Marriage and Family
Social Cognition
Interpersonal Processes
Prejudice and Discrimination

Movies

To learn more about reference groups, see:

Last of the Mohicans (1992), directed by Michael Mann, produced by Morgan Creek Productions.

To learn more about stereotypes, see:

Menace II Society (1993), directed by Albert Hughes and Allen Hughes, produced by New Line Cinema.

To learn more about prejudice, see:

Jungle Fever (1991), directed by Spike Lee, produced by Universal Pictures.

The Web

You can use key words to search the World Wide Web for additional information about social psychology. Here are a few key words to get you started: social psychology, prejudice, conformity, compliance, aggression, environmental psychology, and altruism.

Books

To learn more about crime and aggression, read:

John E. Hodge, Clive R. Hollin, and Mary McMurran, *Addicted to Crime?* (John Wiley & Sons, 1997).

To learn more about prejudice, read:

Elisabeth Young-Bruhl, *The Anatomy of Prejudices* (Harvard University Press, 1996).

To learn more about culture and aggression, read:

Richard Wrangham and Dale Peterson, *Demonic Males: Apes and the Origins of Human Violence* (Houghton Mifflin Company, 1996).

To learn more about love, read:

Robert J. Sternberg, *Love Is a Story: A New Theory of Relationships* (Oxford University Press, 1998).

To learn more about helping behavior, read:

D. A. Schroeder, L. A. Penner, J. F. Dovidio, and J. A. Piliavin, *The Psychology of Helping and Altruism* (McGraw-Hill, 1995).

Review of Key Terms

Can you define each of the key terms in the chapter? Check your definitions against those on the pages listed in parentheses below or in the Glossary/Index at the end of the text.

actor-observer bias (p. S-11)

aggression (p. S-37)

altruism (p. S-46)

arousal:cost-reward theory (p. S-46)

attitude (p. S-13)

attribution (p. S-8)

cognitive dissonance theory (p. S-16)

compliance (p. S-29)

conformity (p. S-29)

contact hypothesis (p. S-20)

deindividuation (p. S-26)

diffusion of responsibility (p. S-47)

discrimination (p. S-18)

elaboration likelihood model (p. S-14)

empathy-altruism theory (p. S-49)

environmental psychology (p. S-45)

frustration-aggression hypothesis (p. S-40)

fundamental attribution error (p. S-11)

groupthink (p. S-53)

helping behavior (p. S-46)

matching hypothesis (p. S-22)

norms (p. S-26)

obedience (p. S-33)

person-oriented (leader) (p. S-52)

prejudice (p. S-18)

reference groups (p. S-4)

relative deprivation (p. S-5)

self-concept (p. S-4)

self-esteem (p. S-4)

self-fulfilling prophecy (p. S-8)

self-serving bias (p. S-12)

social cognition (p. S-3)

social comparison (p. S-4)

social facilitation (p. S-27)

social identity (p. S-5)

social impairment (p. S-28)

social loafing (p. S-28)

social perception (p. S-5)

social psychology (p. S-3)

stereotypes (p. S-18)

task-oriented (leader) (p. S-52)

Multiple Choice

Select the best answer to each of the questions below. Then check your responses against the Answer Key in the Appendix.

1. _____ are sets of people to whom we compare ourselves during self-evaluation.
 - a. Reference groups
 - b. Relative groups
 - c. Career groups
 - d. Out-groups
2. Jack is depressed. He took a job in the city after completing graduate school on a scholarship and graduating with honors, but now he compares himself to people who are older, richer, and wiser than he is. Jack is experiencing
 - a. cognitive dissonance.
 - b. relative deprivation.
 - c. role isolation.
 - d. a self-fulfilling prophecy.
3. Jack's state of mind has been influenced by a change in his
 - a. reference group.
 - b. relative group.
 - c. social identity.
 - d. self-schema.
4. When Alaa says, "I am a Muslim," he is describing his
 - a. self-esteem.
 - b. self-schema.
 - c. social identity.
 - d. social perception.
5. During Gena's first day at work, her boss was short-tempered and gruff with her. From then on she was constantly prepared for more nasty comments from him. Gena's defensiveness irritated her boss further and caused him to become even more short-tempered. The change in the boss's behavior most likely occurred as a result of
 - a. a stereotype.
 - b. prejudice.
 - c. a self-fulfilling prophecy.
 - d. discrimination.
6. The tendency to attribute our successes to internal factors and our failures to external factors is called the
 - a. actor-observer bias.
 - b. fundamental attribution error.
 - c. self-fulfilling prophecy.
 - d. self-serving bias.

7. In his effort to market a particular brand of toothpaste, Richard includes a picture of a well-known, beautiful woman in the ad. He is encouraging the _____ in his presentation of this product.
 - a. central route to attitude change
 - b. direct route to attitude change
 - c. peripheral route to attitude change
 - d. persuasive route to attitude change
8. People sometimes behave with fewer inhibitions when they are in a group than when they are alone. This phenomenon is called
 - a. diffusion of responsibility.
 - b. deindividuation.
 - c. situational ambiguity.
 - d. social facilitation.
9. George and Louise share their thoughts, hopes, and daily worries and plan to stay married until death parts them. They also enjoy an active and creative sex life. According to Sternberg's theory, George and Louise's relationship would be described as _____ love.
 - a. consummate
 - b. companionate
 - c. fatuous
 - d. romantic
10. Which of the following are good predictors of whether people will form a committed relationship?
 - a. similar attitudes
 - b. similar degrees of attractiveness
 - c. similar ways of dealing with anger
 - d. both (a) and (b)
11. When Ashley laughed during her uncle's funeral, the other members of her family felt very uncomfortable. Ashley's laughter exemplified
 - a. deindividuation.
 - b. social facilitation.
 - c. social loafing.
 - d. norm violation.
12. Shawn's instructor doesn't monitor her students' performance in study groups, so Shawn exerts himself less in these groups than he would when alone. Shawn is exhibiting social
 - a. facilitation.
 - b. impairment.
 - c. loafing.
 - d. passivity.
13. In a group, conformity is most likely when
 - a. the situation is unambiguous.
 - b. the majority is unanimous.
 - c. men but not women are present.
 - d. women but not men are present.

14. Colleen wants to take a day off work during final exam week, but she knows that her boss won't be too happy about this idea. She explains that she really needs to study and asks for the whole week off. After the boss refuses, she asks for the one day off that she originally wanted. Colleen is attempting to use the
 - a. conformity method.
 - b. door-in-the-face procedure.
 - c. foot-in-the-door technique.
 - d. obedience method.
15. Obedience entails
 - a. conformity to a request.
 - b. private acceptance of a suggestion.
 - c. yielding to a command from an authority figure.
 - d. a response to aggressive behavior.
16. Which of the following environmental factors has been associated with aggression?
 - a. crowding
 - b. collectivism
 - c. barometric pressure
 - d. all of the above
17. According to the arousal: cost-reward theory, Ruth will be most likely to help a lost child crying in the mall if she
 - a. has lots of shopping to do.
 - b. is upset by the crying and has the time to help.
 - c. never shopped in that mall before.
 - d. knows what it feels like to be a lost child.
18. Which of the following summarizes the evolutionary view of helping behaviors?
 - a. People feel good when they help others.
 - b. People display helping behaviors to protect their gene pool's chances of survival in future generations.
 - c. People are motivated to protect other individuals.
 - d. People learn to be helpful.
19. A task-oriented leadership style is most useful when the job to be done
 - a. is structured.
 - b. is unstructured.
 - c. does not need to be completed rapidly.
 - d. is well understood by employees.
20. The phenomenon of poor decision making in closely knit groups with strong leadership is called
 - a. deindividuation.
 - b. groupthink.
 - c. catharsis.
 - d. social impairment.

If your writing falls apart, it probably has no primary ideas to hold it together

SHERIDAN BAKER

Professor, author of The Practical Stylist

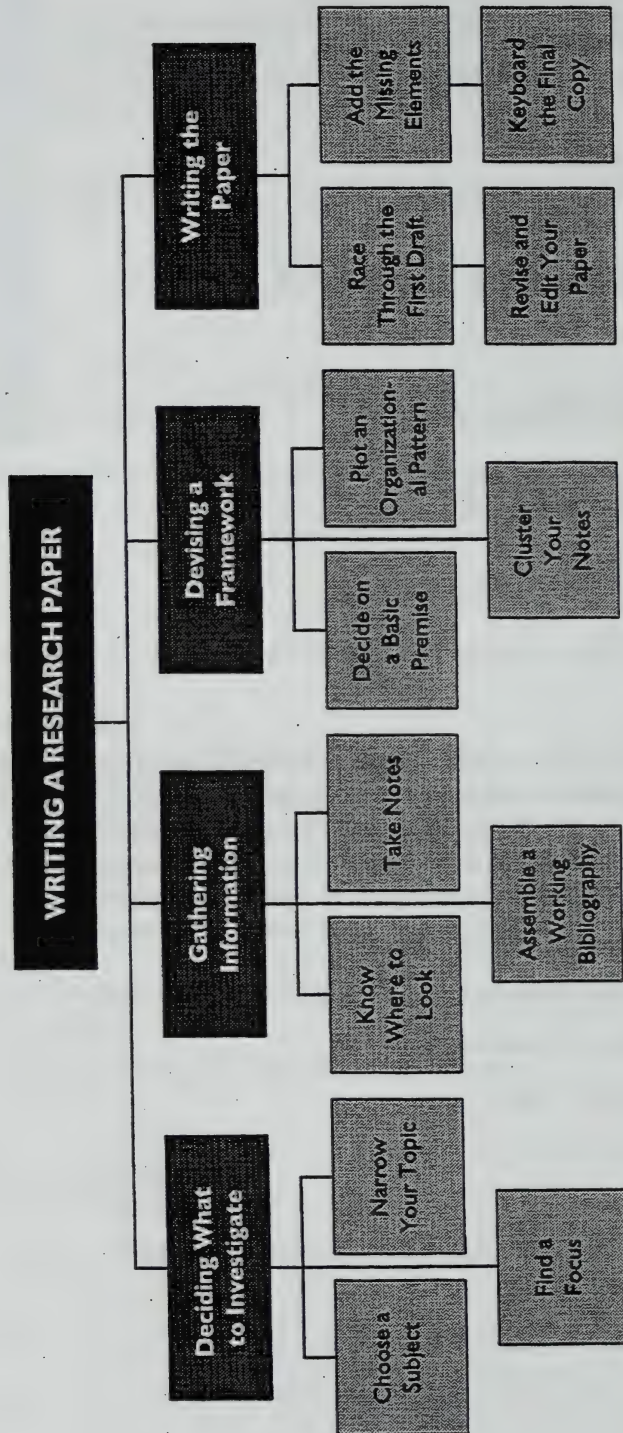


Supplementary Chapter A

WRITING A RESEARCH PAPER

From the time it is assigned until the day it is due, a research paper can occupy your mind like no other type of assignment. Although writing a research paper can be time consuming, it doesn't have to be overwhelming if you take the process one step at a time. To give you a head start in the art of the research paper, this chapter provides a calm and well-organized system for

- Deciding what to investigate
- Gathering information
- Devising a framework
- Writing the paper



Writing even a modest research paper can take a lot of effort. Yet though the task is long, the skills it requires aren't sophisticated, and most of them aren't new. In fact, writing a paper isn't much more difficult than reading about a subject in detail, taking notes on your reading, organizing your notes, and reciting, all the activities you undertake to prepare for a test or quiz. The difference is that instead of reciting out loud, you put your recitation on paper in a form that makes what you've learned readable for others. If you realize that writing a paper is not much different from studying your notes, and if you systematically decide what to write about, gather information, devise a framework, and then do the actual writing, you may even find that writing papers can be a most absorbing way to learn about a subject.

DECIDING WHAT TO INVESTIGATE

Finding a suitable topic is often the biggest stumbling block in research. It's essential that you know how to choose a topic easily and efficiently. There are three steps in the process of selecting a topic: Begin with a general subject that interests you, narrow it down, and then sharpen it even further by finding a focus. If you follow these steps, you'll wind up with a topic that is both interesting and specific.

Choose a Subject

In most cases, you'll be selecting a topic from a broad subject area. Because you'll be spending a great deal of time on the subject, your best bet is to choose one you are interested in or can develop an interest in. And if it isn't a subject that others are researching, then so much the better.

If you aren't sure what subject to select, do some preliminary research at the library. Scanning the bookshelves in your area of interest, consulting the *Reader's Guide to Periodical Literature* or a computerized periodical listing, and asking for assistance from a reference librarian will introduce you to an array of possible topics. In addition, the trip to the library will warm you up for the full-fledged research that lies ahead.

Suppose you are fascinated by natural disasters and want to learn more about them. But the subject "natural disasters" includes scores of topics: droughts, floods, tornadoes, hurricanes, volcanoes, and earthquakes, to name just a few. How can you do justice to them all? Obviously, you can't. You must narrow your topic.

Narrow Your Topic

Selecting a topic that interests you is just the beginning. The most common criticism of a research paper is that its topic is too broad. A Cornell professor of English suggests this method for narrowing your topic: Put your subject through three or four significant narrowings, moving from a given category to a class within that category each time. This method is similar to the Silver Dollar System (see Chapter 5), which enables you to select the main ideas from your notes.

For example, if you select natural disasters as the topic for a ten- to fifteen-page research paper, then you have to narrow the scope of your topic before you can cover it in adequate depth. Three narrowings will probably reduce the subject down to a manageable size, although four may be necessary.

General Topic: Natural Disasters

First narrowing: earthquakes

Second narrowing: earthquake prediction

Third narrowing: scientific developments in earthquake prediction

Fourth narrowing: computer simulations in earthquake prediction

Concept maps, which are explained in Chapter 13 and are similar to those in this book, can be used to “visually” narrow a topic. Write your general subject on a blank sheet of paper and circle it. Next write down subtopics of your general subject, circle each, and connect them with lines to the general subject. Then write and circle subtopics of your subtopics. At this point, you may have a suitably narrow subject. If not, keep adding levels of subtopics until you arrive at one. (See Figure A.1.) The advantage of narrowing your topic with a concept map is that you provide yourself with a number of alternate topics should your original topic choice prove unworkable.

Find a Focus

Once you’ve narrowed your topic, give your research direction and purpose by developing a compelling question about your topic. The information you gather from your research can then be used to develop an answer. For the topic “The use of computer simulations in earthquake prediction,” you might ask, “How helpful are computer simulations in earthquake prediction?”

General Topic

Natural
Disasters

First Narrowing

Floods

Hurricanes

Tornadoes

Earthquakes

Second Narrowing

Prediction

History

Prevention

Destruction

Third Narrowing

Superstitions

Scientific
Developments

Fourth Narrowing

"Earthquake
Weather"

Animal
Predictors

Wave
Detection

Computer
Simulations

Paper Topic

FIGURE A.1 Using a Concept Map to Narrow a Topic

Whether you actually arrive at a definitive answer to your research question isn't crucial. The important thing is to focus your research efforts on answering the broad question.

GATHERING INFORMATION

The next step in your research is to begin gathering information. That requires knowing where to look (and knowing what you're looking for), building working bibliography, and then taking detailed notes.

Know Where to Look

Unless you're using firsthand information—from interviews or experiments—nearly all your material will come from the library. During this stage of your investigation, the library's most valuable resources will be the reference librarian, indexes, periodicals, and books.

Get Help from the Reference Librarian Before you begin your research, as well as any time during the process when you hit a snag, seek out the reference librarian. Although librarians may not be experts on your particular subject, they *are* experts at using the library's research tools. Librarians can often suggest indexes you may not have heard of, sources you didn't think to consult, and searching strategies you didn't try.

Consult Periodical Indexes Most of your research will come from periodicals and books. It's wise to consult the articles that relate to your particular topic before you begin to delve into books. Not only do periodicals frequently provide the most recent information on a subject; sometimes they supply the only information. In addition, articles often include important names and titles that relate to your subject and occasionally provide a valuable overview of your topic.

There are a number of general and specific indexes, both bound and computerized, for periodicals.

Use Bound Indexes. The most prevalent bound index is the *Reader's Guide to Periodical Literature*. Each volume lists by author and subject all the articles that appeared in several dozen magazines during a given year. To locate articles on your topic, consult the years in which you think those articles may have been published. Each entry in the *Reader's Guide* gives you the information you need to locate the appropriate journal or magazine.

Your paper topic may pertain to a subject that has its own index. For example, if you are doing research in psychology, you can refer to several indexes that deal specifically with psychology and that include journals and magazines that aren't listed in the *Reader's Guide*. A number of other subjects, such as business and education, have their own indexes. In addition, large newspapers such as the *New York Times* publish indexes of their articles.

Use Computerized Indexes. Many libraries now use computerized magazine indexes such as Info-trac that enable you to type in the name of a subject, author, or title and receive a list of relevant articles. You may also be able to customize your search with key words and/or Boolean searching.

Key word search. Key words can provide the most direct route to the articles you are seeking, especially when searching by subject isn't convenient or fruitful. For example, if you want information about Gregg Toland, the cinematographer who worked with Orson Welles on the movie *Citizen Kane*, you may come up empty if you use the subjects "Toland" or "Citizen Kane" in your search. The database simply may not have enough articles on these topics to justify a separate subject heading. If, however, you search for articles under a broader subject, such as "Motion pictures—American," you may have to scan through hundreds of citations before you find appropriate ones. With a key word search, by contrast, you can type in a word (or name) such as "Toland," and the computer will reply with every article in its database that contains the key word you have typed.

Boolean search. A Boolean search enables you to narrow your search by combining two key words. Suppose you need information about the Detroit Lions football team. If you searched under the subject "Detroit," "Football," or "Lions," you would have to scan thousands of citations that have nothing to do with your particular topic. But by searching for titles that contain both key words—"Football" and "Lions"—you are likelier to pinpoint articles that deal directly with your topic.

These computerized indexes have some advantages over bound indexes and some disadvantages as well.

Advantages

Speed. If you know what you're looking for, you can usually come up with a list of periodical entries in less than a minute.

Consolidation. Unlike many bound indexes, which have a separate volume for each year, a computerized index normally includes a wide range of years. A single computerized search can cover more ground.

A written record. Most computerized indexes are connected to a printer. Once you find the sources you are looking for, you can print out the citations immediately.

Abstracts. Some computerized citations include an abstract that summarizes the points of the articles and that helps you determine whether it would be worth your while to read.

Disadvantages

Limited listings. Most computer indexes list only relatively recent entries. If you're searching for an article that is more than fifteen years old, for example, you will probably have to look for the citation in a bound index.

Outdated information. The information in a computerized index is stored on a compact disc, which must be replaced whenever the listings need to be updated. Some libraries update their discs frequently; others do not.

Limited availability. If the wait at the computer index looks long, you may be wise to do your research with the bound indexes instead. The time-saving advantage of the computer index will be lost if you have to wait too long to use it.

Consult Book Indexes Books usually have their own indexes—on individual cards or in a computer.

Use a Card Catalog. The card catalog generally consists of several large cabinets and a series of long, small drawers divided by author, title, and subject and arranged alphabetically. To use the card catalog effectively, you may need to use the author, the title, and the subject sections. If you know the names of experts in the area you are researching or if you're already aware of titles of books on the subject, you'll want to consult both the author and title catalogs. If while scanning articles in magazines or journals you've uncovered the names of authors or books that relate to your subject, you'll want to find out whether your library has any of these books. Finally, you'll want to check in the subject catalog for other books pertaining to your topic.

Use a Computerized Catalog. Many libraries have replaced the traditional card catalog with a set of computer terminals that enable you to quickly find the same information without flipping through dozens of index cards. Instead of scanning a large list of books, as you did with the card catalog, you simply type in the information you are seeking and the computer responds. Like the traditional card catalog, most computer catalogs allow you to search for a book based on its subject, title, or author. In addition, many computer catalogs include advanced commands similar to those used with the periodical index.

Assemble a Working Bibliography

As you discover magazines and books that relate to your research, add them to a *working bibliography*—a list of promising sources that you plan to consult. Be generous in compiling your list. It's better to check out several references that do not help than to miss a good one because its title isn't appealing.

Instead of listing all these references on a large sheet of paper, you can use a separate 3 × 5 card for each reference. Then later on, if you decide that a particular reference doesn't help, you can simply throw away its card.

Figure A.2 provides an efficient format for putting your bibliography on 3 × 5 cards. On the front of the card, record the following information:

- The name of the library where the periodical or book is located
- A short title of your subject. A title will make it easier to locate a particular card and will aid in clustering your information.
- The library call number
- The reference information—that is, the author, title, publishing data, and page references—in exactly the form that you plan to use it in the bibliographical portion of your paper. This ensures that you will include all the essential parts of the reference and that typing your paper will be much easier.

On the back of the card, jot down your assessment of the reference. If the source doesn't seem useful, then briefly explain why. If the source appears helpful, jot down how. Then when you have a chance to take another look at the article or book, you'll know why you thought it would or would not be useful. And if you shift the focus of your paper, you'll be able to determine whether sources you had eliminated should now be consulted and whether previously promising sources will no longer be of help.

Olin Library	Theories of Memory
Q 360 .C33	Campbell, Jeremy <u>Grammatical Men</u> . New York: Simon & Schuster, Inc., 1982.

3 x 5 Card with Data

Bottom-up and top-down theories of memory described in Chapter 18. Refers back to previous chapters and is difficult to read in spots. Provides solid summary of the two theories. Uses simple, vivid examples to explain difficult points.
--

Reverse of 3 x 5 Card with Comments

FIGURE A.2 Working Bibliography: 3 × 5 Card Method

Take Notes

Using your bibliography as a springboard, you can investigate your sources and begin taking notes. There's no getting around it—taking notes is time consuming. But if your notes are easy to use, neat, brief, and accurate, then the bulk of your paper will be written by the time you have completed the note-taking step.

Making Sure Your Notes Are Easy to Use To make your notes easy to use, jot each note on a separate piece of paper rather than writing them one after the other on regular-sized sheets. Three-by-five-inch index cards are commonly used for notes, although you can use slips of paper instead. Whether you use cards or slips, you will be able to rearrange them easily and often because each note is separate.

Another way to make your notes easier to use is by conscientiously identifying each card or slip. In the top left corner, write the author's name or the title of the source you consulted. Then at the bottom right, jot down the specific page on which you found the information. With these two markings on every note card, you can easily verify or add to any information you've gathered for your paper. In addition, you'll have all the information you may need for your citations (see Figure A.3).

Keep Your Note Cards Neat Detailed notes are useless if you can't read them. Write your notes neatly the first time, even if it takes a little longer to do so. Use the modified printing system (see Chapter 10) to write quickly but legibly, and write in pen, instead of pencil, to avoid smears and fading.

Keep Your Note Cards Brief Brevity is the secret behind a useful note card. Get to the heart of the matter with each note you take. Make your notes concise, yet sufficiently detailed to provide accurate meaning.

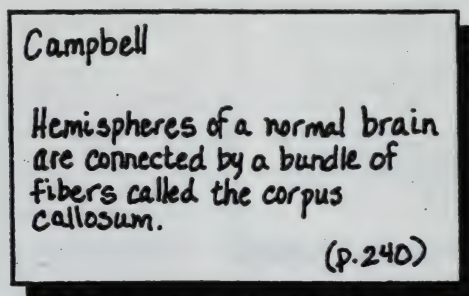


FIGURE A.3 Detailed Note Written on One Side of a 3 × 5 Card

One simple way to limit the length of each note card is by abbreviating common words. For example, use "w/" instead of "with," "co." instead of "company," and "govt" in place of "government." Develop your own abbreviations for words you commonly use. For example, if you're doing research on earthquakes, you may want to use "RS" to stand for "Richter scale" and "tct plates" to abbreviate "tectonic plates." Be careful not to go overboard with abbreviations, however. Abbreviating words may save you time to begin with, but you don't want to waste that time later trying to decipher your unfamiliar shorthand.

Strive for Accuracy Because you're dealing in facts, you must make certain that the information you jot down is accurate. It's relatively easy to remember as you're taking notes who said what and which of the thoughts you are writing down are your own and which are the thoughts of the author. But between the time you fill your last note card and the moment you write the first line of your paper, you're liable to forget these crucial details. To counteract forgetting and to ensure the information in your paper is accurate, distinguish clearly on your note cards between quoted ideas and paraphrased ideas and between the writer's thoughts and your own.

Copy Quotations Carefully. When you quote from a book or an article, make sure that you do so carefully. Place quotation marks on your card around the exact words you copied from the reference. Compare your version with the original quotation to make sure you copied it correctly. Don't change the wording or the spelling of the author's quotation. If you find a misspelling or a grammatical error in the quotation, you may use the bracketed notation [sic] to make it clear to your reader that you're aware of the mistake.

If you leave out a section or even one word from a quote, use three ellipsis points (. . .) to indicate the omission. If the words you left out came at the end of a sentence, add a period before the ellipses.

The purpose of an ellipsis is to leave out information that doesn't relate to the point you are using the quotation to support. An ellipsis should not be used to rearrange a quotation simply to suit your needs. Ellipses are intended to abbreviate a quotation, not alter its meaning.

Mark Thoughts of Your Own. Some of your best ideas may occur as you're taking notes. Put these thoughts on paper right away, but do so on a separate note card marked "my idea" or something similar. That way you'll be sure not to confuse your original ideas with the ones you've encountered in your reading.

Paraphrase What You Read. Although it is important to distinguish your original ideas from the ones you have read, there's nothing wrong with

paraphrasing—expressing someone else's ideas in your own words—as long as you give proper credit to the source. If you paraphrase as you take notes you'll often be able to transfer what you've written on your note cards to your draft without changing a word.

DEVISING A FRAMEWORK

You can devise a solid framework for your paper out of a pile of disconnected note cards by deciding on a basic premise, clustering your notes under handful of main ideas, and plotting out a clear, logical organizational pattern.

Decide on a Basic Premise

In the same way that choosing a focus helped provide direction for your research, deciding on a basic *premise* from the notes you now have lays the foundation for your paper's organization. Potential arguments, apparent similarities, and possible theories all have a way of rising to the surface in the process of taking notes. Any of these can be used to form a basic premise which is the fundamental approach that underlies your paper. If a premise doesn't become obvious to you as you're taking notes, go back over the information and ask yourself some hard questions. For example:

Where is this paper heading?

What are the ramifications of the information I've assembled?

What point is most important?

What am I saying?

What do I want to say?

If there's a choice of viewpoint—for or against a question, for example—which view has the most evidence to support it? If you've done a good job of research, you should be able to decide now what you want to say in your paper, and you should have the evidence to support that view right on your 3 × 5 cards.

Cluster Your Notes

The paper's basic premise should act as a magnet for clustering your notes, which enables you to draw out the most important ideas from the dozens of

perhaps hundreds of notes you have written. In most cases, a research paper should incorporate fewer than seven main ideas. These ideas will form the framework for your paper. The cards that remain won't be wasted but will be used as support for the more important ideas. Of course, if a note isn't important enough to be considered a main idea and doesn't provide support for the main ideas, that note should be left out of your paper.

Choosing the main ideas and clustering your research notes require selectivity, the same skill you used not only in narrowing your original paper topic but in studying conventional notes as well (see Chapter 5). In fact, if you find it difficult to pick out a handful of main ideas from a pile of notes, apply the following three-step system to help pinpoint the pillars that will form your paper's supports.

1. Read through your note cards and pick out those cards that seem more important than the others.
2. Now that you have two piles of notes instead of one, pick up the smaller pile and repeat the process, pulling out the most important notes and using them to make up a third pile.
3. Finally, pick up the third pile, which by now should contain only a dozen or so note cards, and find four or five ideas that seem to be the most important ones. These ideas will be the basis of your premise and of the pattern for your paper.

Plot an Organizational Pattern

Your basic premise and personal choice largely determine the pattern your paper will follow. You could use any of the organizational patterns listed in Chapter 8 as the framework for your paper. The time pattern or the process pattern is appropriate for most college papers. For some papers, however, you may be required to develop an argument. A good pattern for such papers is to begin with a statement of your premise and then support it with logical examples that build to a conclusion. This kind of organization affords more flexibility than the others.

You may need to experiment with several patterns before you arrive at a framework that adequately accommodates the information you want to include in your paper. Don't be discouraged by the inevitable period of trial and error.

There's no one "correct" way of plotting your paper. You may feel most comfortable using a traditional outline. Or you may find the process of *mapping* easier and more enjoyable.

To map out your research paper, use the index cards that contain your paper's main ideas and subideas (or jot these ideas down on small slips of

paper). On a clear surface such as a desk or a tabletop, shift the cards around like checkers on a checkerboard, clustering them in various ways, according to the premise of your paper.

If you're planning to structure your paper using the time or process pattern, arrange your ideas so they follow logically from the earliest to the latest or from the start of the process to the end. If you're structuring your paper as an argument, decide which of the major points should be made first; then arrange the remaining points in an order that will make your argument smooth, logical, and easy to follow.

The chapter maps in this book provide examples of the process and argument patterns. The map in this chapter, for example, uses the process pattern, spelling out, in order, the steps for writing a research paper. The map for the text's Chapter 14, in contrast, develops an argument; it asserts a premise—managing test anxiety requires preparation—and supports the premise by detailing the ways to prepare.

When you arrive at an arrangement that incorporates your information and makes logical sense, you have found a suitable pattern for your paper. Once you have arranged the cards that contain your major points in an effective order, repeat the procedure by arranging the cards that contain your minor points. Think of each major point as a premise in itself. Then arrange the minor points that support a major point in a clear and effective way.

If, as you arrange your cards, you find gaps in your organization, you may need to create new categories or perhaps even return to the library to take more notes.

Finally, with all points arranged to your satisfaction, go back and number your cards according to the order in which they'll appear in your paper.

WRITING THE PAPER

You already have most of your paper worked out—information, sources, organization. Now all you have to do is put your data into sentences and paragraphs and work up a first draft of your paper. Once that is accomplished allow yourself plenty of time to go back and revise and edit what you've written, add the missing elements, and type or keyboard the final copy.

Race Through the First Draft

The best way to start writing is simply to write. Pausing with your pen poised over an empty page or with your fingers resting idly on a keyboard waiting for inspiration to strike is a useless endeavor. Inspiration, like concentration

seldom comes when you call it. Once your hands are engaged in the physical motions of writing, your brain will follow.

Write your first draft as rapidly and spontaneously as possible. To ensure continuity, record your thoughts on paper as they go through your mind. Don't stop to ponder alternatives. Although you will probably write too much, don't be concerned; it's easier to cut out than to add.

In your first draft your goal is simply to transfer information from your notes to your paper. Take each card in order and write. Start with major point one. State what it is, and then use supporting evidence to show why it is so. As you use a reference from the card, note the card number on your paper. You can put the footnotes in later, taking the exact information from the card. Continue to write, following your organized and numbered cards.

Only after you've completed your first draft should you step back and take a look at what you've written. If you typed your draft into a computer, print out a hard copy so you can jot down your comments. Regardless of whether your draft was handwritten, typewritten, or printed by a computer, go over what you've written and pencil in changes, adding words or phrases and circling lines or paragraphs you want to move or remove. Figure A.4 shows a page from a first draft, complete with annotations, insertions, and other marginal markings.

While your markings are still fresh in your mind, write or type a clear copy that incorporates all your changes. Don't wait before adding in these corrections. If you delay even a day, you may lose a lot of time trying to recall exactly what you meant by some of your notes. And if you type or rewrite the material while it's still fresh, you may find that you do some spontaneous revision.

Once you have made these changes, put your draft aside for a while. To gain objectivity about what is in the paper and what is still missing, you need a cooling off period of at least a day. When you return to your paper, you'll then easily spot errors and weaknesses in your writing.

Revise and Edit Your Paper

The hardest part of writing a research paper is completing the first draft. From that point on, you'll be refining what you've already written. In the next drafts—and you may write two, three, or even four drafts before you are satisfied with your paper—you'll focus on strengthening supporting evidence and fine-tuning technical details such as transitions, grammar, and spelling.

Strengthen Supporting Evidence Students often state a main point and then go on to something else without supporting it. The kinds of evidence you need to support a major point are statistics, quotations from other published

Intro
sometimes
a stumbling
block

Even if you ~~have~~ make a false start and have to discard and begin over, you will have made the plunge and will be mentally set to write.

If you have constructed a careful outline, ~~and have~~ thought about your topic, and have done a conscientious job of research, ^(if research is necessary for the kind of paper you are doing) you should be able to produce a first draft that (is reasonably close) in substance & general organization to what you want to say. ~~Write as rapidly and spontaneously as you can. Don't try this first time round to shape perfect sentences.~~

^{with your outline before you,} Write as rapidly and spontaneously as you can. Don't strive, on this first draft, for gemlike perfection of sentences and paragraphs. ~~The~~ Your aim at this point is to get your ideas and information down on paper. True, it is likely to be a very rough draft — ^{scribbled, afterthoughts,} full of deletions, additions, and ^{messy with} jotted notations. But now you have something tangible to work with. When you have finished your first draft, read it through, and then, while the whole thing is fresh in your mind, make notes of any points you ^{have} left out, any new thoughts that come to you as you read, or any places where you would like to make changes or improvements. Now, make a clean copy while all these matters are fresh in your mind, incorporating

FIGURE A.4 Page from a First Draft

works, facts, examples, comparisons and contrasts in views, expert opinion, and description. If you make statements and follow them up with generalities, you will not convince your reader that your main point is true. Use what you have collected on your cards to support your points. Here, with examples, are the steps you can take to develop a major point:

1. State your point clearly.

The two sides of the human brain perform distinct functions.

2. Develop the point beyond a brief statement.

According to the theory of brain laterality, the left hemisphere of the brain handles analytical thinking, while the right hemisphere is the home of abstract thought.

3. Support with data from authorities and with statistics.

Drs. Michael Gazzaniga and Roger Sperry found that the cerebral hemispheres process information differently (add reference here). Subsequent research determined that the brain's left and right sides contrast information that is symbolic and conceptual versus information that is nonsymbolic and directly perceived.

4. Illustrate with examples.

For example, if you were to add up a column of numbers, you would probably be using the left side of your brain. But if you were sketching a picture, you would be engaging the right side.

Be sure that all the main points are supported about equally with this kind of evidence. If you can't find enough evidence to support one point, perhaps it's not a major one. You may need to reorganize the structure to include that point under one of the other major points.

Avoid padding. You may be tempted to add words or to rephrase a point to make the paper longer. Such padding is obvious to the reader, who's looking for logical arguments and good sense, and will not improve your grade. If you haven't enough evidence to support a statement, leave it out or get more information.

Fine-Tune Technical Details Although awkward transitions, clumsy grammar, and poor spelling may not affect the basic meaning of your paper, they do affect the reader's perception of how you have thought about your topic and what you have written.

Provide Transitions. In writing your paper, consider how to help your readers move easily from one main point to the next. If they feel that there's no connection, they will find it hard to follow the logical sequence that you have established in your own mind. You must therefore use transitional words and phrases to make your paper easy to follow. (See Chapter 8 for a list of these words.) Check carefully for transitions, and insert them where they are needed.

Correct Grammar. Students who use the English language correctly get their ideas across to other people more clearly and forcibly than do those who stumble over every sentence. Moreover, students who apply the rules of

grammar in their papers earn better grades. If you are unsure about these rules or careless with them, your meaning may get lost. If you feel that you could use a review of grammar, there are good texts that give you the elements of English grammar by a programmed method. Some of them are even fun to read.

Here's a brief list of some popular handbooks of English grammar:

Corder, Jim W. *Handbook of Current English*, 8th ed. Glenview, Ill.: Scott Foresman, 1988.

Diamond, Harriet, and Phyllis Dutwin. *Grammar in Plain English*, 2nd ed. New York: Barron's Educational Series, 1989.

Feigenbaum, Irwin. *The Grammar Handbook*. New York: Oxford University Press, 1985.

Hodges, John C. et al. *Harbrace College Handbook*, 12th ed. San Diego, Calif. Harcourt Brace Jovanovich, 1993.

Shertzer, Margaret D. *The Elements of Grammar*. New York: Collier Books, 1987.

Check Spelling. If your spelling problems are not severe, you will find a dictionary helpful. If your spelling is poor, look for one of the paperback books that list the most commonly misspelled words. If you cannot recognize the words you are spelling incorrectly, have someone who is good at spelling read your paper and mark, not correct, the words that are wrong. Then look up the words and insert the correct spellings. If you do this conscientiously over a period of time, you will improve your spelling.

Of course, if you are writing your paper on a computer, you can use a spell-checking program to pinpoint your spelling mistakes. The spell-checker compares each word you have typed with the words stored in its dictionary and calls your attention to words that don't appear there. Although the computer can catch many of your spelling errors, it isn't infallible. The size of the dictionary is limited, and the spell-checker is unable to recognize words that are spelled correctly but used incorrectly (such as "there" instead of "their").

Add the Missing Elements

Having revised and edited your writing, you can now add the missing elements that will make your paper complete. Because your paper is a research paper, you must give credit for your information by including citations and a bibliography. In addition, the paper will need a title, an introduction, and a conclusion.

Give Credit Where It's Needed To avoid any appearance of plagiarism and to demonstrate the depth of your research, attribute quoted or paraphrased material and include a bibliography.

Avoid Plagiarism. Plagiarism is stealing other people's words and ideas and making them appear to be your own. It need not be as blatant as copying whole passages without giving credit. If you paraphrase something from already published material and do not cite your source, you're guilty of plagiarism even though you may have no intention of stealing. Simply rearranging sentences or rephrasing a little without crediting is still plagiarism.

Those who grade papers are quick to notice a change in writing style from one of your papers to another or from one part of your paper to another. Your writing is like your fingerprints—individual. If you try to use another's work, his or her style will not match the rest of your paper, and the difference will be obvious. Instructors may give you the benefit of the doubt if they cannot prove where you got plagiarized material. But if they can—and doing so is usually not difficult—plagiarism is grounds for expulsion from college. In a world where the written word is a major product, stealing it from someone else is a serious offense.

Include Citations. Avoid plagiarism by crediting material you've quoted or paraphrased to its source. You may include a credit right after the quoted material, within the body of the paper, in a format like this: (Jones 1996, p. 264). This citation refers to page 264 of the work by Jones that was published in 1996 and is listed in your bibliography. Or you can use a superscript ¹ and cite the full source at the bottom of the page or in a complete listing at the end of the paper. Credits that appear at the bottom of the page are called *footnotes*. Figure A.5 shows a format for footnotes and for credits at the end of the paper. References are numbered in the order in which they appear in your paper. Other forms are given in handbooks on English usage.

Supply a Bibliography. The bibliography lists the sources you cite in your credits and may include other books or published material that you read as

1. Richard Webster, *Why Freud Was Wrong* (New York: Basic Books, 1995), pp. 136–154.
2. Glenn Alan Cheney, *Journey to Chernobyl* (Chicago, Ill.: Academy Chicago Publishers), p. 107.

FIGURE A.5 Format for Footnotes and End-of-Paper Credits

background for the paper but did not quote. A bibliography is not "notes," "endnotes," or "sources." It is a listing of the books that you used in preparing the paper, and you should use the correct title for this listing. When you compile the bibliography, use the 3 × 5 cards you prepared earlier. Each entry should include enough information so that a reader can identify the work and find it in a library.

Entries are listed alphabetically by author. Different bibliographic forms are used in different fields. Either select a standard form from a handbook on English usage, or follow the form used in one of the journals on your subject.

Ask your reference librarian to assist you in finding the style manual for a specific field such as biology, chemistry, law, mathematics, physics, psychology, and so forth.

The following three widely used general style manuals will provide you with a form for your citations and bibliography:

Achtert, Walter S., and Joseph Gibaldi. *The MLA Style Manual*. New York: The Modern Language Association of America, 1985.

The Chicago Manual of Style. 14th ed. Chicago: University of Chicago Press, 1993.

Webster's Standard American Style Manual. Springfield, Mass.: Merriam-Webster, 1985.

No matter what form you use, follow it consistently for every entry in your bibliography. Figure A.6 shows a common bibliographic form.

Choose a Suitable Title It is often a good idea to wait until you have written the paper before you decide on a title. Although the title should reflect the content of the paper, you can give it an interesting twist or perhaps make use of part of a quotation that seems particularly appropriate. Of course, there's nothing wrong with a straightforward title. In many cases, a no-nonsense title that gets straight to the point is your best choice.

Write an Introduction The paper's premise serves as the basis of the introduction. In revising your paper, you can expand on this premise and come up with the introduction in its final form. In addition to stating your premise, the introduction explains how you plan to support it and can include an apt example, anecdote, or quotation. Choose any of these devices carefully; they must be right on target. If you're not sure they will contribute to the paper, then write a straightforward statement.

Bibliography

Carlson, Karen J., Eisenstat, Stephanie A., and Ziporyn, Terra, *The Harvard Guide to Women's Health*. Cambridge, Mass.: Harvard University Press, 1996.

Field, Shelly. *100 Best Careers for the 21st Century*. New York: Macmillan, 1996.

Hanke, Steve H. "The Stagnation Myth," *Forbes* 157 (April 22, 1996) 145-146.

Krefetz, Gerald. *Read and Profit from Financial News*. 2nd ed. Dearborn, Mich.: Dearborn Financial Publishing, Inc., 1995.

Maughan, Jackie Johnson, ed. *Go Tell It on the Mountain*. Mechanicsburg, Pa.: Stackpole Books, 1996.

Quammen, David. *The Song of the Dodo*. New York: Scribner, 1996.

Wertheimer, Neil, ed. *Total Health for Men*. Emmaus, Pa.: Rodale Press, 1995.

FIGURE A.6 Format for a Bibliography

State a Conclusion Don't end the paper without a concluding passage. If you do, your readers will be left dangling, wondering what happened to you and the rest of the paper. Let them know they have come to the end.

By now, all your major points should have been made and adequately supported. The primary purpose of your conclusion is to restate or summarize your basic premise. In addition, you may want to use your premise to draw a related conclusion. For example, if your premise states that alcohol is one of the country's leading causes of death and your paper has supported that contention with data and examples, you may want to conclude with some suggestions for dealing with the problem of alcohol abuse:

Taxes on alcoholic beverages should be increased.

Beer, wine, and liquor companies should be made to subsidize alcohol treatment programs.

Americans must overcome their tendency toward self-destructive addictive behavior.

Alcohol education should begin at the elementary school level.

Although the rest of your paper should be backed up with information you discovered through research, the conclusion affords you the opportunity to state your own opinion and draw a personal conclusion.

In general, of course, the kind of conclusion you write depends on the paper and the subject. In most cases, the conclusion need not be long and involved. But be certain you include one.

Keyboard the Final Copy

All the time and energy you have spent on your research paper should be reflected in the appearance of the final copy. Make it neat, clean, and attractive.

1. Use only one side of white paper. Although instructors seldom specify, most assume that your paper will be written on 8½ by 11 sheets.
2. Leave a generous margin at the top and bottom of each page and a margin of 1½ inches on both sides to provide room for the instructor's comments.
3. Type your paper or have it typed or word-processed. Of course, if you've written your paper on a computer, you can have it printed. Handwritten papers are, difficult to read and may not even be accepted in some courses.
4. Set up long, direct quotations (of five or more lines) in block style—that is, single space and indent the lines from both sides about a half inch or five typewriter spaces. Omit the quotation marks when you block a quotation in this way—the block setup shows that you are quoting.
5. Proofread your final copy. Go over it carefully to catch spelling errors and other minor flaws. This is a very important step.

SUMMARY

How do you arrive at a research topic?

Start by selecting a general subject that interests you. Then narrow it down to a topic that's specific enough to cover in depth but large enough to allow you to find a sufficient amount of information. Finally, focus your topic by asking a question that gives your paper direction and purpose.

What sort of information should you look for, and where can you find it?

Look for books and magazine articles that deal with your specific topic. You can find them in the library by searching the card catalog (or computerized card catalog) for books and by consulting an index such as the *Reader's Guide* or *Info-trac* for magazine articles. If you get stuck in your search, ask a reference librarian for help.

How do you assemble a working bibliography?

Write the bibliographical information for each reference you plan to consult on the front of a 3 × 5 card. Use the back to summarize your opinion of each article or book.

How can you ensure that your notes are easy to use?

Jot each note on a separate 3 × 5 card. On each card, write the author and the page number of the source so you'll be able to verify the accuracy of your notes with ease and have all the information you need for citations. Use the modified printing style to write both quickly and neatly, and write in pen to prevent your notes from fading or smearing. Take concise but detailed notes. Use abbreviations for common words.

How can you ensure that your notes are accurate?

To ensure that the information in your notes is accurate, make a clear distinction among your own ideas, paraphrased information and quoted material. Copy quotations exactly as they appear in the source. If you shorten a quotation, insert an ellipsis in place of the words you've removed.

How do you decide on your paper's basic premise?

The premise for your paper can grow out of potential arguments, apparent similarities, or possible theories that you've developed from going over your notes.

How do you cluster your notes?

Select the note cards with the most important ideas you have jotted down, and then group the other notes beneath the idea they support. If a note doesn't support any of the main ideas, do not include it in your paper.

How do you plot out a pattern for your paper?

Use your premise as a starting point to organize your clusters of information into a logical pattern. Most college research papers follow one of three basic forms: the time pattern, the process pattern, or the development of an argument.

How should you write the first draft?

Speed, not style, is the key to completing your first draft. For now your goal is simply to get everything written down. Move systematically through your note cards, turning notes

How can you strengthen your paper's supporting material?

How do you fine-tune technical details?

What missing elements do you need to add?

What are the requirements for the final copy?

into sentences and combining sentences into paragraphs.

You can do so by double-checking your paragraphs to make sure that each idea is sufficiently developed. If an idea lacks support, bolster it with further explanation, data from authorities, statistics, or examples.

Use transitional words and phrases to guide your reader through your paper. Make sure your grammar and spelling are correct: consult an English handbook or a dictionary when in doubt.

You should include a citation for every reference you make, a bibliography of the sources you used, a title, an introduction, and a conclusion. These make your paper complete.

Your final copy should be neat, clean, and attractive. Type it carefully with generous margins, using only one side of each sheet of white paper, and double-check each page to make sure it is free of errors.

MY FIRST RESEARCH PAPER

By Walter Pauk

Registration was like a game of chess. The smart students made their moves early. Some lined up before dawn, while others used the university's new computerized system to register from home by telephone. They registered early, not especially to get the best courses, but to avoid being "stuck" with one—the one taught by Professor Wilbur Hendricon.

The word on the grapevine was that this was a course to be avoided by the faint of heart. The chances of being forced into Professor Hendricon's course were slim but still too terrifying to take a chance. Professor Hendricon had, as the students said, "a special deal with the administration." He could hand-pick twenty-five students for his class, but had to take another ten at general registration.

This unusual procedure was a compromise. It came about this way: Professor Hendricon had taught only graduate courses before; but ten years ago he decided that he would like to teach one section of English 105. So

Professor Hendricon suddenly proclaimed to the dean that he would take twenty-five first-year students and turn them into scholars.

The dean was faced with a dilemma. On the one hand, a negative answer might be taken as a rude rebuff by the proud and sensitive Hendricon. Also, the dean thought, "If he resigns, I will have to answer to the president." Hendricon was the university's brilliant light and he was eagerly sought after by other universities. On the other hand, a positive answer would be a blow to the morale of the other members of the English Department, who had no choice but to take their usual thirty-five students per class. The dean consulted her colleagues and persuaded them to accept the compromise. Needless to say, I was one of the unlucky ten.

Right from the very first day in class, I could see how well Hendricon had chosen. The twenty-five were geniuses. I later discovered that they all had straight As in high school and that they were clustered at the top of the scholarship list. Furthermore, they excelled in language and literature, while my strengths were in mathematics and music. Math skills and musical talent did not count for much in an English course.

At first I thought Professor Hendricon's legendary standards might just be rumor, but after the first test any hopes evaporated. We unfortunate ten compared notes and found our grades in the 30s and 40s. But no one questioned Professor Hendricon's honesty and sincerity. Our papers were filled with notations, symbols, and helpful comments. We did, however, question his standards. They were not for us mortals.

Six of the ten transferred to other sections of the course immediately; the other three students transferred after the second test. Everyone knew that transferring was possible. The other instructors expected to get all ten of us in their classes within the first few weeks of term. In this way morale was preserved, because administratively, at least, all the classes started out with thirty-five students each.

Perhaps it was the lemming instinct in me or perhaps it was Hendricon's appeal, but I decided to hang in. On the day after the last date for changing classes, I took my usual seat. The other twenty-five students, who usually chatted loudly until Professor Hendricon entered the door, were strangely silent today. You see, in all these past ten years, not one of the unchosen had ever stayed in Hendricon's class. Everyone knew this.

We could hear Hendricon's brisk but firm footsteps drawing closer to the open door. The pace was faster than usual. We saw the toe of his left foot puncture the blank space of the doorway. The blood was pounding at my temples. My breathing was fast and shallow. Hendricon always walked straight to the lectern, put down his notes, and said "good afternoon" to the class. As he entered today, he glanced at me with a curious look. He did not greet the class as usual. He just lectured, but more seriously. I could not keep

my mind on the lecture. No one could. It seemed that I had spoiled the atmosphere of this select club. Why had I not been less foolhardy?

On Monday, however, the class resumed its normal pace and atmosphere. I was present but not accepted. The chosen twenty-five sat in a solid square. I sat outside the square, separate but linked like an appendix. But that did not bother me, for I was really fascinated by Professor Hendricon. He was a great teacher. I took copious notes and studied the assignments carefully. I occasionally forgot myself and spoke out during discussions. I worked hard on tests and examinations, but they were never quite up to standard. I could usually understand the ideas and concepts, but time always ran out. I needed more time to think. But I was not discouraged because I was enjoying the course and learning a lot.

It was just after the Christmas holidays that Professor Hendricon announced it. "It" was the research paper—3,500 words and counting for one-third of the final grade. I should have been petrified because I could not write, and yet, I was glad. This was my chance to raise my present hard-earned average of 62.7% to the necessary 70.

This would be the first instance where I would have an advantage over the students—I would have the advantage of time. I needed time. Time is the great equalizer; time is democratic. We all receive the same amount of it every morning. No distinction is made between the genius and the plodder. This is what I told myself; it helped me feel a little better.

There should not have been any excitement because everyone knew about the Hendricon paper. It was indeed another factor that encouraged the rush to register early for other courses. The paper was not due until after the late winter break—almost two months off. But still, there were groans and whisperings. I could hardly hear the professor's caution against plagiarism. "Use both the primary text as well as secondary critical sources," he instructed against a background of restless inattention. Very few paid attention to his next point about thinking carefully before choosing a topic. I somehow caught, "Once you have decided on your topic it should be narrowed three or four times." What did he mean by this?

After the others had left, I edged up to Professor Hendricon, who was gathering up his lecture notes, and asked about the idea of narrowing the topic. He said, "If, for example, you were doing a history course, and you chose as your topic the 'Civil War,' you would be almost sure to fail. You simply could not do justice to such a large topic—dozens of books would be necessary to cover that subject, not an undergraduate research paper. Even a second narrowing of the topic to the 'Battle of Gettysburg,' a major engagement in the war, would still be too broad. A third stage of narrowing such as the 'Battle of Cemetery Ridge' would be more manageable, but your focus might not be sufficiently defined yet. So perhaps a further narrowing to the 'Tactical Importance of Cemetery Ridge' might be necessary. This would

be an aspect of the original broad topic on which adequate information could be found to write an in-depth paper."

I was so excited about writing the term paper that I went straight to the library eager and determined to find an interesting topic on which to use this technique of narrowing. I was surprised to find the cavernous library so empty of students. But of course, there would be time during "reading week" and the late winter break—there was no pressure yet. I went directly to the reference librarian who showed me how to use the various special reference books. Another librarian, who joined us, had an interesting idea. She said, "If you choose a subject area carefully in your first year, and continue throughout your university years to research and write in that area, you could probably become quite an expert." This idea intrigued me.

Over the next few days I brainstormed possible topics for my paper. First, I scrutinized Professor Hendricon's course outline, mulling over his lecture themes and the prescribed authors and texts. Then I returned to the library to peruse reference books such as encyclopedias, surveys of literature, and biographical dictionaries. I developed a list of nineteen topics that interested me. I reflected on these over the weekend and after careful deliberation rejected fourteen of them.

The remaining five topics I decided to discuss with Professor Hendricon. He seemed happy to see me. In about five minutes we eliminated two. As far as the other three were concerned, he suggested that I talk about each with professors who were experts in the respective areas.

These talks were especially stimulating. I got to know three new professors from whom I received not only useful insights about narrowing the topics but also details of important sources and prominent authorities as well. After thinking through the suggestions made by these professors, I settled on the area that was most appealing to me.

I arranged another session with Professor Hendricon to inform him of my decision and to obtain advice on the direction my assignment should take. We discussed the precise purpose of my paper, and, over a cup of tea, we juggled words and finally formulated a challenging question to launch my research. I emerged from his Dickensian study aglow with inspiration and enthusiasm. The stern and serious Hendricon of the lecture hall had a warm and sensitive side that few students had glimpsed.

So, with the topic narrowed and a clear sense of direction established, back to the library I went to search for sources and to start my research. With the first week over I was surprised to find none of the class in the library. During the first term I had learned how to use the library's computerized catalogue. Why not explore other searching opportunities offered by the computer system, such as using a key word to locate titles relevant to the focus of my research? I was amazed at the wealth of material available through the computer catalogue, and soon I had an impressive list of titles in my working

bibliography. Gaining confidence, I decided to use the CD-ROM databases and discovered a number of periodical articles pertaining to my research question.

I gathered some of my sources and began taking notes on pages of paper. The reference librarian, ever helpful, wandered over and asked if I knew the advantages of recording my notes on 3×5 slips. Without waiting for an answer, she said that the ability to categorize my notes would ensure a much more efficient research system. Her specific suggestions were these:

- Record only one point, or a small cluster of related points, on one card.
- Record only information that is relevant to the purpose of your research.
- Use only one side of the card.
- Each card should indicate the author and page numbers of the source.
- Enclose all verbatim notes in quotation marks.
- Most notes should be paraphrased or summarized.
- Whenever you have a thought or insight of your own, jot it down and enclose it with brackets to signify "my own."

Noticing that I had no slips, she darted to her desk and pulled out the bottom drawer and thumped several rubber-banded stacks of cards on my table. "These are old cards left over when we converted the catalogue to a computer system. They are only used on one side. You are welcome to use them for your research notes."

The card method intrigued me and now that I had a wide-ranging list of sources, I was anxious to get started on the research. I worked steadily in the library for the next two weeks, averaging two to three hours a day. It was surprisingly easy jotting down important information and ideas on cards and indicating the sources and page numbers. Rather than waste time writing out the author's name or the title on each card, I used a simple coding system to identify each source. I did not have a written outline. I had tried to prepare one after formulating my question, but I could not anticipate the material I would find. I also sensed that it would be too restricting. However, although I did not have an outline, it would be unfair to say that I selected the material for my note cards haphazardly. I selected material that had a bearing on my specific question. Once I immersed myself in the research, I began to sense what was relevant and what was not.

After two weeks, I had a shoebox full of cards. I was ready to start structuring and drafting the paper. During the course of the research I had sketched out a tentative list of sections that might serve as an outline. I stepped back from my intense two-week spell of research to reflect on the provisional outline. Keeping the research question uppermost in my mind, I modified the

sections so that they would provide a structure around which I could shape my answer. Next, I read through all my note cards and moved them into categories corresponding to my outline. Having notes on each card that pertained to only one idea permitted me to place the cards in separate categories. If I had put two different notes on one card, I would have had to rewrite the information onto two separate cards now. I was glad that I had a system. It was like playing cards.

My outline required further modification because not all the cards fitted the major sections. I added another section to accommodate some of the cards, while a number of cards simply did not fit into any of the sections. So, with the cards in categories, I started to follow the second step of the librarian's advice. I began to shift the piles of cards into an order that seemed logical for my paper. It was surprisingly easy to re-order the piles of cards so that there was a logical flow in the sequence of the sections.

With the categories of cards spread out before me, I began to study each category independently to create a detailed outline. As I wrestled with sections, subsections and supporting material I began to see where I had gaps in data and weak spots in the argument. My detailed outline revealed plainly the areas in which my paper lacked balance and completeness. My work was cut out for the next few days since I needed specifics that the paper presently lacked. I was glad that each card carried a reference to the source, so that I could locate not only the source but the precise page as well.

After a few hours of additional research in the library, I was able to augment my note cards. I felt that the more complete I could make my collection of cards, the more effective the first draft would be. I remembered Professor Hendricon's advice: "If you do not gather enough first-class material, you will have trouble writing a major paper." I used some of the new research information to revise and refine my detailed outline.

Finally, I was satisfied with my outline. Then I began to write the first draft. It surprised me to see how easy it is to write a long paper once the material is placed in order. I actually enjoyed the process. It took four days of writing in my spare time to complete the draft. I preferred writing my first draft in longhand because I seemed to think more clearly when writing rather than typing. On each day, I concentrated on writing one of four major parts of the paper. When I had finished, I immediately read it over and it sounded good to me—so good that I knew I would be able to enjoy the late-winter holidays. A wonderful reward. First, I had to type up my draft on the computer, and after saving it carefully on the hard drive, I took the floppy disk over to the computer center and printed a copy. I proudly left the copy on my desk to cool while I went home for the holidays.

On the last day before we departed for our week's holiday, Professor Hendricon did his duty as a teacher to remind us to work on our papers because they were due five days after our return to campus. The students

fidgeted, a nervous laugh or two mingled with some of the spontaneous whispering, but no one said anything. I thought to myself that I had not seen any of the chosen twenty-five in the library; but then they could have been there at other times. Also, the thought struck me that they loved to discuss every moot point and debate hypothetical issues. They seemed to excel at writing creative papers, often at the last minute, with information they already had in their heads. Perhaps a research paper that demanded hard and dogged work was just too rigorous for their creative souls. Well, I just thought these thoughts and was a bit ashamed at my suspicious mind.

Even though I was still failing Professor Hendricon's course, the warm feeling generated by my completed draft provided the tone that I needed to enjoy my holidays. I had a good rest.

I arrived back on campus on Friday to avoid the weekend traffic. That evening, feeling proud of myself, I casually picked up my draft and, to extract the maximum amount of satisfaction from my accomplishment, I began reading. By the time I had finished page 3, my smile had vanished, and by page 10 fear had gripped me. The development of my thesis, which sounded so smooth upon completion, was now disjointed and repetitious and some paragraphs were meaningless. How could that be?

I pacified myself after the initial shock by realizing that I still had several days, while many of the other students in the class had not even started their papers. Most of them would only arrive back on campus on Sunday evening and that would leave them but a scant five days. As I pondered how to fix up my research paper, I realized for the first time, the truth of the words which I had discarded as "teachers' preachings": "No paper should ever be handed in unless you have revised it. For the revision to be effective, you must always put your paper away for a few days so that you will lose some familiarity with it. Then, when you reread it, you will be better able to spot the weaknesses and the rough sections. Once these are spotted, revise, revise, revise."

My paper was certainly rough. I recalled the steps for revising: first look through the draft to make sure the ideas are understandable and supported by details and examples. Second, make sure the organizational plan for the paper is clear and that the sections are in logical sequence. Third, check for consistency of style, and, finally, ensure that the mechanics such as spelling and hyphenating are correct. I discovered that I had scattered throughout the paper bits of interesting information—interesting but not always pertinent. I had added some of the misplaced material to the introduction and eliminated the rest. It was tough to throw away these gems that I had worked so hard to extract from my sources, but I heard ringing in my ears: "Good writers do not put everything down that is interesting. Remember the iceberg with nine-tenths underwater and only one-tenth showing above the surface. The submerged part—your background work—gives the iceberg its strength and power."

After weeding out the irrelevant material, I concentrated on the structure of the paper and discovered that it, too, was a bit vague. Parts of the general statement that should have been at the beginning were in the body of the paper. So I sharpened the introduction by stating the thesis and then broke it down to the five main points that I had planned to establish and support. By the time I had reworked the introduction, I really knew for the first time what I was attempting to do. I was shocked to realize that my own understanding of what I was trying to do had not been clear. By the time I went to sleep on Sunday, I had hammered out a clear statement of what I was trying to establish and support.

Monday rolled around all too soon. The vacation was over. There was a lot of activity on campus as students accelerated into a faster tempo of study. Papers were due, final examinations hovered on the horizon, and most plans to complete work during the holidays had fallen through. Hendricson reminded the class of the Friday deadline. There was no whispering this time, just grim silence. I, too, contributed to the silence. I had to write not only a passing paper, but a paper good enough to earn an 85 if I was to raise my average to the passing grade of 70. I had, perhaps, counted too heavily on time and technique. Time was running out and technique was not holding up. But I still had a chance. Most of the chosen twenty-five, I was sure, had not even started.

I worked hard to strengthen the body of the paper by realigning my main sections in the same order as in the statement of thesis in the introduction. I made sure that each main section led off with a brief paragraph that introduced the section. Then I grouped the supporting information in a number of separate paragraphs all focused on the central idea of the section. As I worked through the other sections checking the paragraph structure, I was surprised to discover that some of the supporting materials were still widely scattered even though I had carefully laid out a sequence when I grouped my note cards. By moving some of the information to more appropriate sections, I was able to eliminate repetition. I reworked each main section, especially those that seemed vague or hastily composed. Occasionally, I dug back into my collection of note cards when an idea needed additional support.

On Tuesday I fashioned a concluding summary that was not repetitious, synthesizing the thesis and key points in such a way to show mastery of the material. After dinner I took my disk over to the computer center and printed a copy of the complete paper. I was immensely relieved and satisfied when I fell asleep that evening.

After the 9 o'clock class on Wednesday, I was free to devote the whole day to the final editing of the essay. I first read the entire paper aloud, checking for style. By reading aloud I could better detect redundant words, vague phrases, and awkward sounding sentences. I corrected the flawed sentences so that they flowed smoothly and naturally. As part of the editing process, I

made frequent use of a dictionary and a thesaurus to ensure that the vocabulary was precise. Also, I worked on internal transitions to give my paragraphs and sentences better cohesion. After I had edited the printed copy, I corrected the computer version and saved it carefully. I was meticulous in backing up copies on diskette in the event my computer malfunctioned.

I woke early on Thursday excited to see the final copy in print at last. I rushed down to the computer room after breakfast and printed out my "magnum opus." I was so anxious to start proofreading that I toyed with the possibility of skipping my morning lectures. But with final examinations looming, common sense won out! After lectures, I gobbled my lunch down and headed for my room and my prized paper. I proofread it meticulously, from title page to bibliography. All my thoroughness had paid off—not a single error was apparent. I was flushed with that warm feeling of satisfaction that the completion of a creative assignment brings.

This was it. This was the day! I never heard such an outpouring of incidents to a professor from frantic, frightened students who tried so hard to look and act sophisticated. "The library is so full, you can't find a table to write on." "Two other students are working on the same topic as I am and I cannot get hold of the sources." "My computer crashed." "My printer overheated and seized up." "I'll need more time, because all the typists in town are busy, and they can't get to mine until after the weekend."

Hendricon was calm but exceedingly serious. He looked around the room solemnly, making no attempt to answer any of the excuses. After a moment he held up his hand for quiet and went on with his lecture as if nothing had happened. There was deep silence that hour. Professor Hendricon was always good, but he was especially good that day. He talked hard and earnestly. Most of the students sat glumly, motionless and glassy-eyed. Only a few had the discipline to take notes. For some reason, the professor's words seemed to be aimed at me. He was trying to make scholars of us, as well as mature men and women. About half the students handed in papers that day. Spurred by the announcement, "Five points a day will be deducted on all late papers, the rest were in on the following Monday. I was pleased and proud that mine was in on time.

With only two and a half weeks to go, Professor Hendricon lectured hard and fast, determined to complete his schedule of lectures. By now, I had reconciled myself that failure was a possibility. Though I still wanted to pass the course, I was not too worried about it. I was just glad to have had the opportunity to attend Professor Hendricon's class.

On the last day of class, Professor Hendricon strode in with our research papers. "Before I hand them back to you," he said, "I want to talk about them both generally and specifically." He continued, "A few of the papers were excellent, a few poor, and the majority mediocre. The excellent ones were creative and imaginative in their use of technique; but the poor ones seem

as if they had been put together artificially and mechanically with scissors and paste."

That last remark hit me. Of course, I should have known that Professor Hendricon would be quick to see the artificial way my paper was put together: how I took notes on cards; distributed them in piles; mechanically shifted stacks of cards around; made an outline last, not first; filled gaps by digging out more material; mechanically revising, looking up words, reading aloud to detect faulty intonation—all done like a "hack" in mechanical and piecemeal fashion. The rest of the class had real talent—they were truly gifted. In four or five days, they were able to write down their thoughts directly, fully developed, like true artists. And like true artists, they made good with one chance, whereas I had dozens of chances to write and rewrite.

As Professor Hendricon continued to talk about "scissors and paste," he suddenly picked up a paper to illustrate a point. I was shocked. I could tell it was my paper. I just couldn't stand the embarrassment. All I wanted to do was to get out of that room, fast! Then I suddenly realized that though I knew it was my paper, no one else did. So I steeled myself. Professor Hendricon read one paragraph after another. He jumped to the first part of the paper for a paragraph, then to the end for another. Then I noticed that the rest of the class was listening attentively, and though Professor Hendricon's voice was excited, it was kindly. As I calmed and composed myself, I heard, "Note the smooth rhythm of the prose and the careful choice of words. This is what I mean by scholarship. The technique is discernible. Yes! But put together with a scholar's love, and care, and time."

P.S. You guessed it! I passed the course.

HAVE YOU MISSED SOMETHING?

Sentence Completion

Complete the following sentences with one of the three words or phrases listed below each sentence.

1. Give your research purpose, direction, and focus by developing a _____ about your topic.
 scientific discovery fascinating misconception
 compelling question

2. When you are using the computerized magazine indexes of a library, a Boolean search enables you to narrow your search by _____
 using a prominent key word combining two key words
 using a full sentence
3. As you discover magazines and books that relate to your research, add them to a working bibliography that is _____
 in your notebook on separate 3 × 5 cards on separate 5 × 8 cards

Matching

In each blank space in the left column, write the letters preceding the phrases in the right column that matches the left item best.

- | | |
|--------------------------------|---|
| _____ 1. Compelling question | a. Can help you find a suitable topic |
| _____ 2. <i>Reader's Guide</i> | b. Synopsis found at the beginning of some journal articles |
| _____ 3. Abstract | c. Can be used to visually plan your paper |
| _____ 4. Index | d. Helps provide a focus for your paper |
| _____ 5. Ellipsis | e. Primary source for most of your paper's information |
| _____ 6. Concept map | f. Good starting point in the search for books or magazines |
| _____ 7. Preliminary research | g. Best-known index of periodicals |
| _____ 8. Library | h. Indicates that part of a quotation has been omitted |

True-False

Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Three or four narrowings should reduce your general topic to suitable size.
- _____ 2. A working bibliography consists of only those references you cited in your paper.
- _____ 3. Info-trac is an example of a computerized magazine index.

- _____ 4. Like a card catalog, a computerized catalog enables you to search by subject, author, or title.
- _____ 5. A "cooling off" period is helpful between the writing of your first draft and your second draft.
- _____ 6. Paraphrasing is permitted in a research paper.
- _____ 7. A conclusion isn't always necessary in a research paper.

Multiple Choice

Choose the phrase that completes each of the following sentences most accurately, and circle the letter that precedes it.

1. The basic skills for writing a research paper are similar to those for
 - a. writing a novel or short story.
 - b. preparing for a test or quiz.
 - c. taking notes during a lecture.
 - d. doing none of the above.
2. The most common criticism of research papers is that they are
 - a. too broad.
 - b. too long.
 - c. poorly written.
 - d. carelessly researched.
3. The *Reader's Guide* is a common example of a
 - a. Boolean search.
 - b. style manual.
 - c. periodical index.
 - d. card catalog.
4. A research librarian is an expert on
 - a. most research paper topics.
 - b. the proper form for footnotes.
 - c. use of the library.
 - d. all the above.

5. Your notes will be easier to use if you
 - a. recopy them so they are easy to read.
 - b. copy all your information verbatim.
 - c. jot down each note on a separate index card.
 - d. fit them on as few pages as possible.
6. In writing your first draft, you should emphasize
 - a. speed.
 - b. accuracy.
 - c. style.
 - d. neatness.
7. You can avoid the appearance of plagiarism by including
 - a. quotation marks.
 - b. citations.
 - c. a bibliography.
 - d. all the above.

Short Answer

Supply a brief answer for each of the following items.

1. List some of the advantages and disadvantages of a computerized magazine index.
2. How can Boolean searching be used to pinpoint references?
3. How can concept maps be used in organizing a research paper?

Vocabulary Building

Directions: Make a light check mark (✓) alongside one of the three words (choices) that most nearly expresses the meaning of the italicized word in the phrases that are in the left-hand column. (Answers are given on page 99.)

	1	2	3
1. <i>brevity</i> is the secret	seriousness	lengthiness	briefness
2. jot down your <i>assessment</i>	appointment	function	evaluation
3. to <i>counteract</i> forgetting	overcome	promote	reinforce
4. trying to <i>decipher</i>	encode	decode	rewrite
5. use three <i>ellipsis</i> points	spherical	orbital	periods
6. <i>delve</i> into books	grow	probe	put away
7. clearly and <i>forcibly</i>	predictably	lightly	powerfully
8. it isn't <i>infallible</i>	unreliable	certain	refutable
9. as <i>blatant</i> as copying	obvious	inconspicuous	easy
10. <i>cite</i> your source	condemn	reveal	conceal
11. grounds for <i>expulsion</i>	exclusion	acceptance	imitation
12. the paper's <i>premise</i>	predicament	preposition	position
13. an apt <i>example</i>	incongruity	illustration	argument
14. <i>scanning</i> the bookshelves	browsing	measuring	arranging
15. <i>relatively</i> recent entries	absolutely	comparably	similarly
16. computer <i>terminals</i>	stations	openings	assignments
17. if you <i>paraphrase</i>	recant	quote	reword
18. <i>subsequent</i> research	following	previous	successful
19. the wallop is <i>ineluctable</i>	unavoidable	probable	unexpected
20. it <i>portends</i> a decline	rejects	foretells	invites
21. and his <i>colleagues</i>	associates	competitors	investors
22. <i>blighted</i> housing projects	improved	promoted	withered
23. <i>loath</i> to see	eager	reluctant	enthusiastic
24. streak of <i>defiance</i>	resistance	gratitude	determination
25. mapping <i>contingency</i> plans	emergency	continuing	corporate

Additional Multiple-Choice Questions

- If you need some help in choosing your paper topic, you can
 - consult the *Reader's Guide to Periodical Literature*.
 - ask a librarian for assistance.
 - scan the bookshelves in your area of interest.
 - do all the above.
- The best way to arrive at a suitable topic for a research paper is to
 - select a topic that is listed in the library catalog.
 - put your subject through three significant narrowings.
 - pick a subject that has a limited number of references.
 - refer to old research papers for a workable idea.

3. Like the traditional card catalogue, the computerized catalog
 - a. allows you to search for a book by author, subject, or title.
 - b. contains information that is only of interest to librarians.
 - c. requires you to scan a long list of names or titles.
 - d. is updated by the library on a daily basis.
4. You can make your notes easier to use by
 - a. taking them on separate 3×5 cards or slips of paper.
 - b. identifying each one with the author or title of the source it came from.
 - c. marking the specific page on which you located the information.
 - d. doing all the above.
5. The basic premise is
 - a. a theory that influences the way you do your research.
 - b. the statement that provides the key evidence for your argument.
 - c. the fundamental approach that underlies your paper.
 - d. a transition that moves you smoothly from paragraph to paragraph.
6. In most cases, a research paper should cover fewer than
 - a. ten main ideas.
 - b. four main ideas.
 - c. seven main ideas.
 - d. three main ideas.
7. The organizational pattern of your paper will be influenced by
 - a. personal choice.
 - b. your basic premise.
 - c. the available patterns.
 - d. all the above.
8. The best way to start writing your research paper is to
 - a. warm up with a detailed introduction.
 - b. "brainstorm" the key points you want to begin with.
 - c. simply begin writing.
 - d. do all the above.
9. All the main points in your paper should be
 - a. backed up with expert opinion.
 - b. illustrated with memorable examples.
 - c. adequately supported.
 - d. linked with generalities.

10. Plagiarism is
 - a. stealing.
 - b. using another writer's ideas without giving credit.
 - c. incorporating quoted material without citing it.
 - d. all the above.

ANSWERS FOR WRITING A RESEARCH PAPER

Sentence Completion

1. compelling question 2. combining two key words 3. on separate 3 x 5 cards

Matching

1. d 2. g 3. b 4. f 5. h 6. c 7. a 8. e

True-False

1. T 2. F 3. T 4. T 5. T 6. T 7. F

Multiple Choice

1. b 2. a 3. c 4. c 5. c 6. a 7. d

Vocabulary Building

1. 3 2. 3 3. 1 4. 2 5. 3 6. 2 7. 3 8. 2 9. 1 10. 2 11. 1 12. 3 13. 2
14. 1 15. 2 16. 1 17. 3 18. 1 19. 1 20. 2 21. 1 22. 3 23. 2 24. 1
25. 1

Additional Multiple-Choice Questions

1. d 2. b 3. a 4. d 5. c 6. c 7. d 8. c 9. c 10. d

The spoken word belongs half to him who speaks
and half to him who hears.

French proverb

C

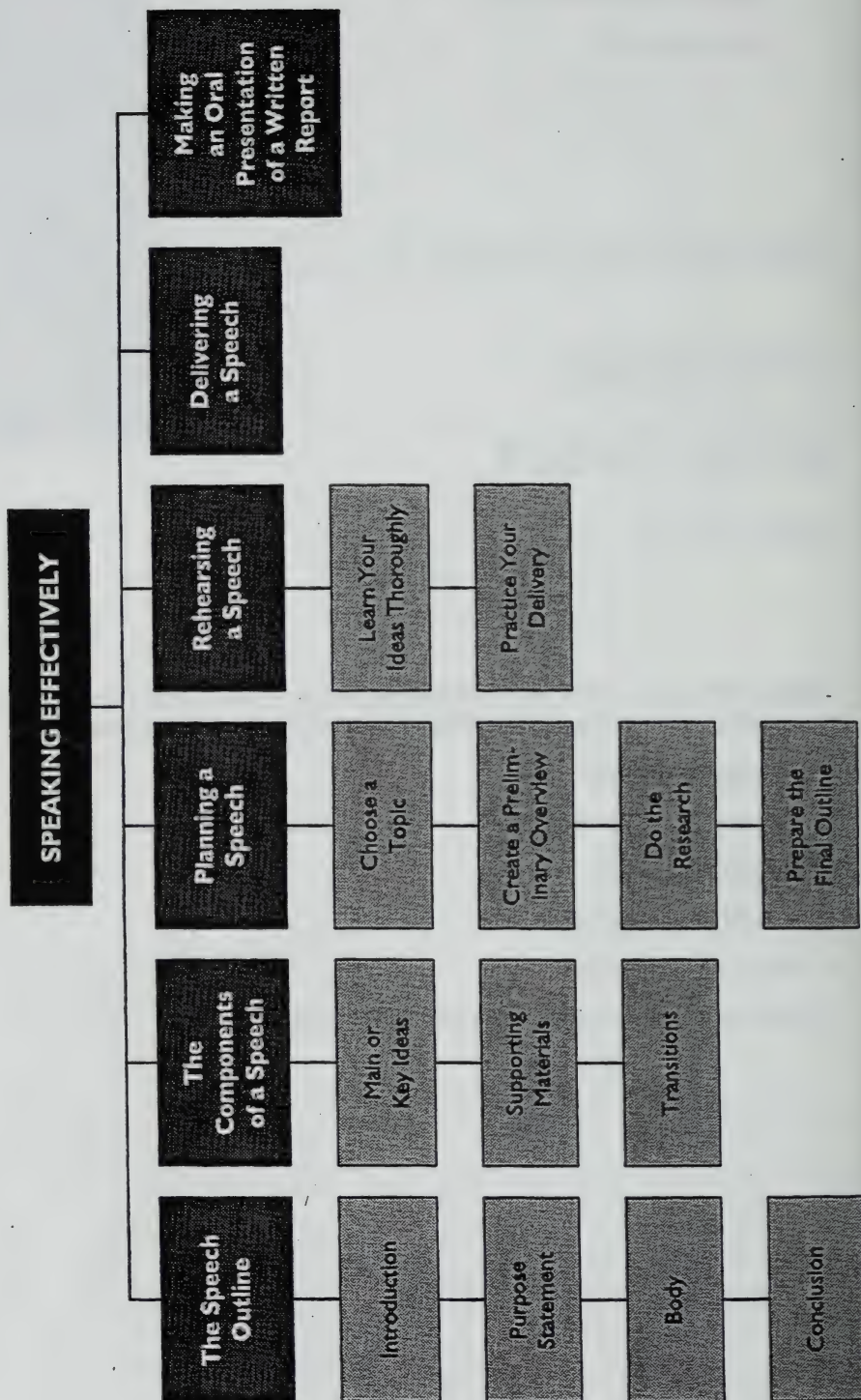
Supplementary Chapter C

SPEAKING EFFECTIVELY

JAMES A. WOODS

Friends, Romans, countrymen: All these people—and many more—could use some pointers about speechmaking. Could you? This chapter discusses

- The speech outline
- The components of a speech
- Planning a speech
- Rehearsing a speech
- Delivering a speech
- Making an oral presentation of a written report



In college you will almost certainly be called on to give speeches or other oral presentations from time to time. If that prospect does not make you jump for joy, you are not alone. Yet the ability to speak effectively before a group is not difficult to develop, and it is a skill that you can use all your life.

Even experienced and successful speakers feel apprehensive before giving a speech, but they have learned to convert nervous tension into constructive energy that makes them alert, vigorous, and effective in speaking. To make nervous energy work for you, rather than against you, you must be fully prepared to do your job and be motivated by a strong and sincere desire to communicate with your audience. This means knowing your subject well, taking ample time to think about and plan what you will say, evaluating your topic from the viewpoint of your intended listeners, and concentrating on giving your audience something of interest and value. You must be audience-minded instead of self-centered. This mental attitude will affect every stage of your speech, from the planning through the delivery.

THE SPEECH OUTLINE

The ideal plan for a speech or an oral report is a very detailed outline that contains from 30 to 50 percent of the number of words in the actual speech. It is thus much fuller than an outline for a written paper but also far from the word-for-word speech. In the outline, you can see the order and relationship of ideas, distinguish main ideas from supporting materials, and note where the major transitions come.

This plan helps you learn the speech as a complete, organized pattern of ideas; it also helps you avoid rote memorization, which often produces stilted, boring delivery. The outline consists of four parts: introduction, purpose statement, body, and conclusion.

Introduction

In the introduction you try to win the goodwill, attention, and interest of your listeners. You may use such devices as a striking example, statistic, or quotation; an interesting but relevant anecdote; or material relating the topic to something in which the audience is already interested. The introduction should also provide any background information the audience is likely to need, such as definitions of important terms or the historical or social context.

Purpose Statement

Your statement of purpose tells your audience what you intend to cover. You should state your topic and either list the main points you intend to cover or explain the basic strategy of your speech. This will give your audience a chance to follow along as the speech unfolds.

The purpose statement usually comes at or near the end of the introduction. You should write it out completely in your outline, in clear, direct language that you will use in your speech. As an example, suppose your introduction reminds the audience that they have studied the way various film directors prepare to shoot films. In this instance, you might state your purpose as follows:

Today, I will explain how Steven Spielberg prepares to make a film. I will consider three main points: how he gets his initial ideas, how he plans the scenario, and how he selects the cast and locations. On each of these three points I will contrast Spielberg's methods with those of other major directors we have studied.

Body

The body or main part of the speech should take up between 65 and 90 percent of the speech. In this part, you develop the topic stated in your purpose statement. The main points listed in your purpose statement now become the main headings in the body of your speech.

Conclusion

The conclusion is essentially a summary of the main points in the body of the speech. It also gives you an opportunity to round off the speech by referring to something mentioned in the introduction, by extending the ideas of the speech, or by specifically relating the speech to the audience.

THE COMPONENTS OF A SPEECH

A speech consists of main ideas, supporting materials, and transitions. A good speaker gives close attention to each of these components, both separately and in combination.

Main or Key Ideas

Shrewd speakers do not expect an audience to remember hundreds of details. Instead, they try to convey only a few key ideas (for example, the four main stages in building a house, or five characteristics of Hemingway's prose style), and they structure the speech to help the audience grasp and remember these ideas. Some of the audience may remember subordinate points also, but these are used primarily to make the key ideas clearer and more memorable.

Thus, when you outline your speech, you must have a precise idea of the main points you wish to put across and the best order in which to present them. You must then build your outline on these points, ensuring that every item in the body of the speech contributes to a main idea. In this way, you make sure not to digress or backtrack and thereby confuse your audience.

Supporting Materials

Supporting materials help your listeners understand, accept, and remember your main ideas. They provide evidence for the main points, relate the subject to the knowledge and experience of the audience, and maintain interest. Because a listener cannot stop to think about or look back at a main point, supporting materials are used more in speaking than in writing, to give the audience a chance to absorb the main points.

Supporting materials should be specific. They may include *factual data*, such as names, dates, places, and events; *examples*, which can be either real occurrences or ones you make up to illustrate a point; *descriptions* of how things look, feel, sound, smell, or taste; *comparisons* and *contrasts* with things familiar to the audience; and *expert testimony* or *opinion*, cited or quoted, or *literary quotations*, when they are apt.

Statistics can be useful but must be handled with care because they are harder to take in by ear than by eye. If they can be translated into concrete or pictorial terms, so much the better. For example, in discussing the estimated number of gallons of water wasted by leaky plumbing over a period of time, you might state the number of homes that could be fully supplied by this wasted water during the same time period.

A special type of supporting material is *visual aids*, which include blackboard or chartboard drawings, poster-type materials displayed on an easel, three-dimensional models, specimens, and films. Visual aids are useful in holding the audience's attention, presenting statistical data (as in graphs), and explaining complicated structures or processes. They should be large enough to be easily readable from the back of the room and contain only a few key words or figures. You should prepare your visual aids in advance and practice

using them to avoid having to think about them as you are giving your speech. Remember to keep your eyes on your audience, not your visuals, as you speak.

Transitions

Transitions help emphasize your main ideas and enable your audience to move with you from one point to the next. If transitions are not clear, your listeners will become confused. An oral presentation requires far more transitional material than a written presentation, and the transitions must be more obvious and repetitive than those used in writing.

For instance, you may emphasize a main idea by *restatement*, saying it twice in different words. This gives your listeners a better chance—a little more time to grasp the idea and to see that it is relatively important.

Another transitional device is *previewing*. Near the beginning of your speech, perhaps within the purpose statement, you may give a preview of the main points you intend to take up. Similarly, at the beginning of each major section, after stating the main idea, you may preview the ground you intend to cover.

If your speech has several sections that are parallel in nature and importance, you may make use of *listing*. You can use either *enumeration* ("First . . .," "Second, . . .," etc.), or a *key phrase* repeated for each main idea, or combination of both ("The first type of jet engine is . . .," "The second type of jet engine is . . .").

Connective transitions tell your audience that you are moving on to a new section of your speech and indicate how it is related to the previous section. "Now that we understand the problem that faced the engineer, let's see how he solved it."

Finally, in *internal summaries* you can condense and restate some or all of the points you have presented thus far.

PLANNING A SPEECH

Choose a Topic

Many speakers get off to a bad start by selecting a topic that is too broad. In ten minutes of speaking, you can cover the equivalent of five to seven typewritten pages. Do not try to get more than three or four main points across in such a short speech. Concentrate on getting these few points across clearly, rather than on packing your speech with information.

If you have a choice, pick a topic that you are interested in. Your interest, or lack of it, will be sensed by your listeners and will influence their reaction to your speech. You will also find the preparation for the speech more enjoyable if you are really interested in the topic.

State your topic in one simple sentence that will serve as a tentative purpose statement. Make sure it is clearly focused. Avoid vague wording such as "I am going to talk about speech preparation and how it makes things easier." Instead, be clear and direct: "This morning, I will explain the five steps involved in the efficient preparation of a speech."

Create a Preliminary Overview

Search your mind for information, ideas, opinions, and bits of supporting material on the topic and for ideas about further sources of information. List them all, and use the list to guide your search for additional information. If you start from what you know and think, your own personality will emerge in the speech. This approach will provide some originality and perhaps even a fresh outlook. You may also want to discuss your topic with friends or experts and check the library to see how much material is available.

Break your subject down into the main areas of ideas that you want to cover. Your topic statements for these areas will become the tentative main headings in the body of your speech.

Do the Research

Use the list you made in your preliminary overview to decide what material you must obtain from the library or from other sources. If you have already checked to see what library sources are available, you can select the most promising ones to try first. Don't overlook your own experience and imagination as a resource, especially for supporting materials such as analogies, comparisons, and actual or hypothetical examples. Keep the needs of both your topic and your audience in mind as you do your research.

Prepare the Final Outline

At this point, you should have a good idea of what your purpose statement will be, since it is the focus of your speech. Plan the introduction and conclusion after the body of the speech—unless you get an inspired idea while you are doing research or working on the body.

The outline for the body of the speech should be taking shape around your main headings while you are doing your research. When you have all your material together, plan the exact phrasing of your statements of main ideas, subideas, and transitions. Write these down in oral style—that is, as you intend to say them in the speech. For example, write “As my last point, I will explain the great care Spielberg uses in selecting his cast and locations,” rather than “Spielberg takes great care in selecting his cast and locations.”

Now add your supporting materials, as subentries under the main headings, but don’t write them out in full as you did the main statements and transitions. A few words to remind you are sufficient. If you botch a main idea or a transition, your whole structure may come crashing down. But if you slip up on a supporting detail or two, the consequences are not so serious. Moreover, your delivery will be more spontaneous if you develop supporting details from notes rather than from preplanned sentences.

At least two days before you are to give your speech, go over your outline and put it into final form. Make sure that you have sufficient supporting materials and that they are relevant to the main ideas; that irrelevant material is deleted; that you have sufficient, clear transitions; and that your key ideas are clearly and forcefully phrased.

REHEARSING A SPEECH

Learn Your Ideas Thoroughly

First, read your outline through several times, both silently and aloud. Your aim should be to learn the sequence of ideas, not to memorize words and sentences. To fix the sequence in your memory, test yourself with questions such as “What are my main points?” and “How do I explain my third main idea?” or “What transition do I use after the section on . . . ?”

Next, say your speech aloud a few times, referring to your outline when necessary. Time yourself to be sure you meet the required time limit. Keep thinking in terms of ideas, not phrases and sentences. Remember that oral speech patterns are more conversational and less formal than written ones.

To maintain contact with the audience when you give your speech, you may want to use conventional speaking notes—an abbreviated outline of words and phrases, typed or written on 3 × 5 (or 4 × 6) cards. These notes will help you keep to your plan but will not tempt you into reading, as your full outline might.

Practice Your Delivery

With your speech plan in mind and your notes in hand, you are ready to practice delivering your speech. Try to duplicate the actual speaking situation as closely as possible. If possible, practice your speech in the room or hall where you are to give it, with a few friends serving as the audience. At least rehearse the speech aloud and standing up. This is your chance to experience the physical feeling of speechmaking. Pay attention to your gestures and your voice, and decide what you are going to do with your hands. Use your speaking notes so you will be accustomed to them. Speak loudly enough to be heard at the back of the room, and try to look alert and confident. Practice sessions are the best time to take care of the mechanics of your delivery. When you actually present the speech, you will want to concentrate on getting your ideas across to your listeners.

Go through the speech from beginning to end. Keep right on going even if you make mistakes—you can give special attention to troublesome parts later. Some students can get by with one or two trial runs; others need ten or twelve. In either case, practice is more valuable if it is spread over two or three days. Even for a simple class report, you should avoid the temptation to practice only at the last minute or not at all. Remember that practice is what produces confident and effective delivery.

DELIVERING A SPEECH

No matter how much you practice, some things can be worked out only in the actual speaking situation. Effective speakers are sensitive to the responses of their listeners and make minor adjustments as necessary. For example, they slow down and insert internal summaries if listeners seem confused, or they omit some supporting material and go on to the next point if listeners seem restless.

An important element in speaking is good eye contact with the audience. You should be in a genuine two-way relationship with your listeners, but this is impossible if you are looking at the ceiling or the floor or are staring at your notes or your hands. When you talk with individuals, you look directly at them. Do the same with your audience. You should have some eye contact with the whole audience, but your confidence will be increased if your eye contact is mainly with the most attentive listeners.

Don't let yourself sag or lean against a desk or speaking stand, and keep from fiddling with a pencil or a ring or your note cards. Stand erect, but feel free to gesture and move naturally. The best time to develop effective gestures, movement, and posture is during your practice sessions.

Speak loudly and clearly enough to be heard and understood by everyone in your audience. Vary your rate of speech and pitch to hold the audience's attention and interest. As a rule, you should speak more slowly and formally when you are discussing main ideas or difficult material and more rapidly and conversationally when you are citing examples or narrating anecdotes. Don't be afraid to pause. Good speakers often use pauses to emphasize important points or to recapture an audience's wandering attention. If you forget what comes next, take time for an unhurried look at your notes.

MAKING AN ORAL PRESENTATION OF A WRITTEN REPORT

In some classes, you may be asked to make an oral presentation of a paper that you must hand in as a written report. This assignment can present a problem, because oral and written presentations differ in significant ways, and the written report may be too long to be delivered in the allotted time. There are three ways to solve these problems.

1. Write your paper and then use it as source material for your oral report. This solution can produce an effective oral presentation, but it requires that you prepare two reports—one written and one oral.
2. Write the paper with the idea of oral presentation primarily in mind. This solution also has disadvantages. For one thing, *writing* a speech is a specialized skill. Moreover, the things that help make an oral presentation a success—the restatement and repetition, the numerous transitions, the supporting materials, the personal and conversational tone—may be criticized as flaws in a written report. Table C.1 contrasts oral and written presentations. Notice how the speaker restates and repeats the points and uses obvious transitions to help the audience move from point to point.
3. Probably the best plan is to write the report as you normally would and then adapt it to an oral presentation. On a clean copy of the written report, note (but do not write out in full) the supplementary supporting materials and transitions you intend to add when you give the report orally. By noting only these items, you allow yourself the chance to work in some conversational spontaneity. Practice reading the paper aloud until you can look up from it frequently to establish eye contact with your audience. Know exactly where the supplementary oral materials come in, and practice moving smoothly from reading to speaking and back again to reading.

TABLE C.1 Written Versus Oral Presentations

	Written Version	Spoken Version
Beginning	Nothing in English history contains such tragic overtones as the Battle of Hastings.	Last hour we discussed the political events that led to the Battle of Hastings. Let us turn now to the tragedy itself.
Thesis	But a divided England was less the cause of downfall than were Norman lances versus English axes.	Thus the English had to fight without the army that was still in the north. More important, the Normans wore armor and fought on horseback, whereas the English had no armor and fought on foot.
Transition	The Normans fought with propaganda, too; the Pope was on their side.	Third, it is important to remember that the Pope favored William, and the Pope's flag on the field frightened many English soldiers away from the battle.
Conclusion	Everything lent William power and conspired to change the fate of England.	To sum up, then, a divided England, superior weapons, and the favor of the Church gave William the advantage in every area of the conflict.

SUMMARY

What is the key to giving a good speech?

A detailed, well-thought-out outline is the key. A good outline contains from 30 to 50 percent of the actual speech. It provides the most important sentences, written as they should be delivered, but it also allows you to be spontaneous.

What elements go into a good introduction?

Your introduction should give the audience a reason to listen. It may provide some particularly interesting examples, statistics, quotations, or anecdotes relative to your subject. It may also include the background that your listeners may need before they can understand the main ideas.

Must all speeches have a purpose statement?

Almost every speech benefits from having a purpose statement. This statement is the audience's first big clue about the content and

The body of the speech should make up what portion of the whole?

What is the purpose of the conclusion of a speech?

What is the purpose of transitions?

How can I choose a good topic?

Should I write out my entire speech?

Is rehearsing necessary? It makes me feel silly.

What can I do to help improve audience response?

organization of your speech. It prepares the audience to follow the development of your explanation or argument.

That depends on your subject and how you plan to develop it. The main points of the purpose statement correspond to the main headings of the body of the speech. Each heading must be reinforced by enough supporting material to explain it effectively. The body can take up anywhere from 60 to 90 percent of your speech.

The conclusion is your chance to tie things together. It gives you the opportunity to summarize, clarify, or extend the ideas of your speech.

Spoken transitions move the audience from one point to another. They accomplish more than written transitions in that they have the extra job of emphasizing the main ideas. They can also give listeners the time they need to reflect on what's been said.

Your topic should be specific and interesting to you. If it is too broad, you won't be able to cover it well. And if it doesn't interest you, you'll have a hard time making it interesting to your audience.

Write out only your purpose statement, main ideas, subideas, and transitions. Outline your supporting materials. Also plan your introduction and conclusion carefully.

You'll feel even sillier if you stumble over your main ideas before a real audience. Rehearsal is essential to a good speech; and the more the rehearsal situation resembles the actual speaking situation, the better.

Do three things to engage your listeners: Look at them, not at the floor or the ceiling. Stand up straight when you're speaking. Vary the pitch of your voice and the speed of your talking.

What's the best way to give an oral presentation of a written report?

On a copy of your written report, note some supporting materials and transitions; don't write them out completely. When you give your oral report, read the main points from your paper, but present the supporting materials and transitions conversationally.

HAVE YOU MISSED SOMETHING?

Sentence Completion

Complete the following sentences with one of the three words or phrases listed below each sentence.

1. An outline for a speech consists of four parts: introduction, purpose statement, body, and _____ .
summary questions conclusion
2. There are three main components of a speech: main ideas, supporting materials, and _____ .
statistics interesting anecdotes transitions
3. In a ten-minute speech, many speakers get off to a bad start by selecting a topic that is too _____ .
popular practical broad

Matching

In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|----------------------------|---|
| _____ 1. Purpose statement | a. The percentage of a speech that should be contained in the outline |
| _____ 2. Practice | b. Guides the audience from one point to the next |
| _____ 3. Transition | c. Tells the audience what you will cover |
| _____ 4. 30 to 50 | d. Can recapture an audience's wandering attention |
| _____ 5. 60 to 90 | |
| _____ 6. Pausing | |

- e. Produces a confident and effective delivery
- f. The percentage of a speech that is devoted to the body

True-False

Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. Good speeches contain many main ideas.
- _____ 2. Supporting materials are used more often in speaking than in writing.
- _____ 3. The purpose statement comes near or at the end of the introduction.
- _____ 4. Supporting materials should be written out exactly as you will read them.
- _____ 5. It's best to start again if you make a mistake while rehearsing your speech.

Multiple Choice

Choose the phrase that completes each of the following sentences most accurately, and circle the letter that precedes it.

- 1. In the introduction of your speech, you seek your listeners' goodwill attention, and
 - a. questions.
 - b. patience.
 - c. advantage.
 - d. interest.
- 2. Inexperienced speakers often choose a topic that is
 - a. too broad.
 - b. too narrow.
 - c. boring.
 - d. controversial.

3. The "script" for your speech should be
 - a. typed onto 3 × 5 cards.
 - b. a detailed outline.
 - c. primarily made up of statistics.
 - d. all of the above.
4. Supporting materials should be
 - a. specific.
 - b. entertaining.
 - c. broad.
 - d. avoided.
5. Previewing, restatement, and enumeration are all functions of
 - a. the purpose statement.
 - b. the introduction.
 - c. main ideas.
 - d. transitions.
6. Throughout your speech, you should try to maintain eye contact with
 - a. your instructor.
 - b. the entire audience.
 - c. the most attentive listeners.
 - d. any listeners who seem bored.
7. The best way to transform a paper into an oral report is to
 - a. use the information from the paper as source material for your report.
 - b. write the paper with the idea of an oral report in mind.
 - c. write your paper and then adapt it for oral presentation.
 - d. deliver the presentation using the original report as your outline.

Short Answer

Supply a brief answer for each of the following items.

1. How are experienced speakers affected by nervous energy?
2. How should statistics be handled in an oral presentation?
3. Explain why practice isn't 100 percent effective when preparing for a speech.

4. What concerns should you keep in mind when transforming a paper into an oral presentation?

Vocabulary Building

Directions: Make a light check mark (✓) alongside one of the three words (choices) that most nearly expresses the meaning of the italicized word in the phrases that are in the left-hand column. (Answers are given on p. 140.)

	1	2	3
1. feel <i>apprehensive</i>	uneasy	unruffled	grateful
2. relevant <i>anecdote</i>	error	cure	story
3. not to <i>digress</i>	stray	continue	repeat
4. the <i>tentative</i> headings	confirmed	powerful	provisional
5. <i>hypothetical</i> examples	substantiated	theoretical	exaggerated
6. more <i>spontaneous</i>	impulsive	contrived	spiritual
7. <i>irrelevant</i> material	germane	apropos	unrelated
8. intelligent and <i>articulate</i>	indistinct	intelligible	incomprehensible
9. <i>paragons</i> of culture	examples	contradictions	rituals
10. <i>raucous</i> person	harsh	mellow	ethical
11. <i>eschews</i> the party line	embraces	shuns	exemplifies
12. <i>atrocious</i> movements	heinous	humane	widespread
13. most <i>infamously</i>	gloriously	notoriously	harmoniously
14. <i>demarcates</i> a portion	delineates	eliminates	redefines
15. the <i>salient</i> event	healthy	minor	prominent
16. a <i>supplicant</i>	provider	petitioner	defender
17. is <i>tantamount</i> to	essential	incomparable	equivalent
18. after that <i>affront</i>	flattery	insult	deference
19. a <i>vitriolic</i> commercial	caustic	affable	lively
20. formidable <i>demagogue</i>	supporter	rabble-rouser	religious preacher
21. a <i>penchant</i> for work	inclination	aversion	hesitancy
22. for the <i>sublime</i>	ordinary	majestic	worthless
23. <i>tantalizing</i> and aloof	taunting	appeasing	unfriendly
24. <i>nascent</i> economy	emergent	deteriorating	cutthroat
25. <i>resonate</i> throughout	reverberate	silent	scatter

Additional Multiple-Choice Questions

1. Reluctance to make speeches is
- rare.
 - common.
 - dangerous.
 - silly.

2. Speaking effectively may often be a matter of redirecting
 - a. public opinion.
 - b. personal goals.
 - c. nervous energy.
 - d. surplus time.
3. Compared with a paper outline, a speech outline is
 - a. fuller.
 - b. neater.
 - c. thinner.
 - d. easier.
4. The primary aim of a shrewd speaker is to convey just a few
 - a. main transitions.
 - b. small details.
 - c. new opinions.
 - d. key ideas.
5. Visual aids are often used as
 - a. purpose statements.
 - b. main or key ideas.
 - c. supporting materials.
 - d. oral transitions.
6. Compared with those in a paper, the transitions in a speech are
 - a. less obvious.
 - b. less important.
 - c. more repetitive.
 - d. more condensed.
7. Normally the introduction is planned
 - a. after the body of the speech.
 - b. right after the title is chosen.
 - c. before the body of the speech.
 - d. without the audience in mind.
8. While practicing your speech, you should think in terms of
 - a. patterns.
 - b. phrases.
 - c. sentences.
 - d. ideas.

9. An effective speaker is sensitive to
 - a. crucial issues.
 - b. audience responses.
 - c. disturbing noises.
 - d. supporting materials.
10. The best way to deliver a written paper orally is to
 - a. write your paper in a conversational tone.
 - b. present your paper as you have written it.
 - c. adapt your paper to oral presentation.
 - d. prepare speech and paper separately.

ANSWERS FOR SPEAKING EFFECTIVELY

Sentence Completion

1. conclusion 2. transitions 3. broad

Matching

1. c 2. e 3. b 4. a 5. f 6. d

True-False

1. F 2. T 3. T 4. F 5. F

Multiple-Choice

1. d 2. a 3. b 4. a 5. d 6. c 7. c

Vocabulary Building

1. 1 2. 3 3. 1 4. 3 5. 2 6. 1 7. 3 8. 2 9. 1 10. 1 11. 2 12. 1 13. 2
14. 1 15. 3 16. 2 17. 3 18. 2 19. 1 20. 2 21. 1 22. 2 23. 1 24. 1
25. 1

Additional Multiple-Choice Questions

1. b 2. c 3. a 4. d 5. c 6. c 7. a 8. d 9. b 10. c

**Albert Einstein's three rules of learning:
Out of clutter, find simplicity.
From discord, find harmony.
In difficulty, find opportunity.**

ALBERT EINSTEIN

(1879–1955), German-born American theoretical physicist

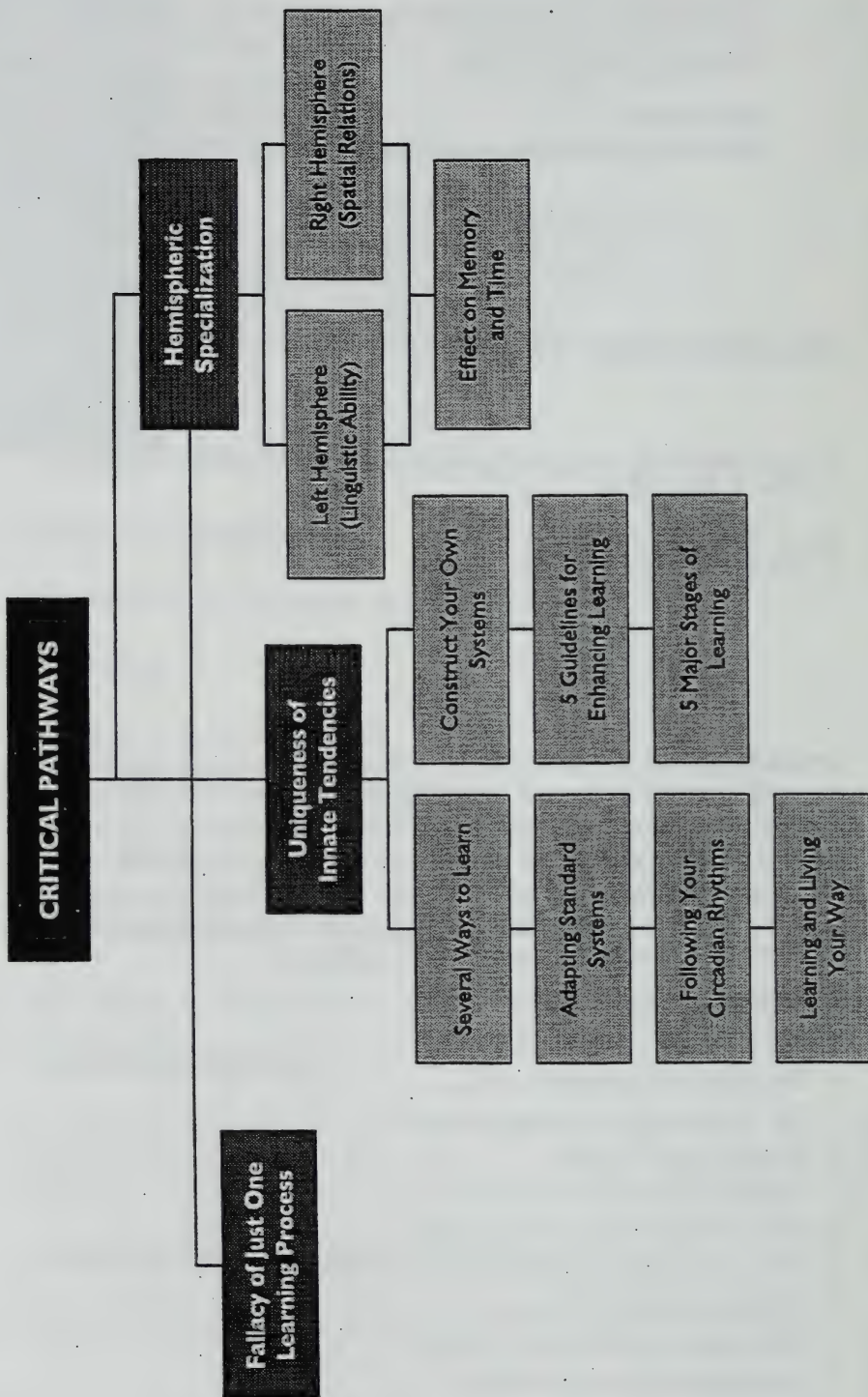
E

Supplementary Chapter E

CRITICAL PATHWAYS

Inundating your life is a massive clutter of high-speed information, often creating confusion, discord, and difficulty. To work your way successfully through this morass to educate yourself, Albert Einstein implies that your natural learning approaches be based on simplicity, which will, in turn, bring about mental equilibrium and harmony, surely helping to turn difficulty into opportunity. For weaving into your learning modes the simplicity advocated by Einstein, this chapter presents information on

- Hemispheric specialization
- The fallacy of just one approach
- The effect on memory and time
- The uniqueness of innate tendencies
- Several ways to learn
- Constructing your own systems
- Five guides for enhancing learning
- Five major stages of learning
- Adapting standard systems
- Following your circadian rhythms
- Learning and living your way



Whatever we learn, obviously, has to be processed by the brain. Research shows that the processing is done by either the left hemisphere or the right hemisphere of the brain or by a combination of both hemispheres.

HEMISPHERIC SPECIALIZATION

As physiologists and psychologists point out, there is "hemispheric specialization." Rosenzweig and Leiman explain this specialization as follows:

The right hemisphere has a small amount of linguistic ability. For example, it can recognize simple words. In general, the vocabulary and grammatical capabilities of the right hemisphere are far less developed than they are on the left hemisphere. On the other hand, the right hemisphere is superior on tasks involving spatial relations. . . . Thus, it is the left hemisphere that possesses language and speech mechanisms in most people. . . . 95% of humans are left-hemisphere dominant, specialized for language. . . . However, the right hemisphere does not just sit within the skull awaiting the call to duty. . . .¹

The Other 5 Percent

I imagine that the other 5 percent of the people who are right-hemisphere dominant most naturally gravitate toward such careers as engineering, architecture, geology, and the many hands-on sciences.

But these careers are not staffed just by people who are right-hemisphere dominant. As mentioned in the preceding excerpt, the hemispheres do not "just sit within the skull awaiting the call to duty." There are people who, no doubt, are strong in both hemispheres, just as there are people who are ambidextrous, using either hand equally well. Such people with strong hemispheres can do the verbal tasks equally as well as the tasks requiring spatial ability. There are gradations all along the continuum. In other words, most people are not just one or the other. They are, in various degrees, combinations of both.

FALLACY OF JUST ONE LEARNING PROCESS

A person cannot simply adopt a single learning process—for example, an "Imagery Process"—to the exclusion of all other learning processes and think

¹Mark R. Rosenzweig and Arnold L. Leiman, *Physiological Psychology*. Copyright © by D. C. Heath and Company, pp. 652-654, 1982.

that he or she has it all, because not all information is amenable to be learned and understood by a single approach.

Kenneth Higbee² points out that the "Imagery Process," which, of course, uses the right hemisphere of the brain, works best with concrete events, objects, and words. For example, the word *apple* can be imagined or visualized very easily; however, when classifying the apple as a *fruit*, you can visualize a basket of fruit but not all of the varieties of fruit in the world.

We can carry this example of an apple two steps further; that is, classifying an apple as *food* and, further, as *nourishment*. To sum up, the word *apple* can be handled by the right hemisphere, but once we move on to the abstract verbal material of *fruit*, *food*, and *nourishment*, the shift over to the left hemisphere is probably automatic, natural, and inevitable, if understanding is to be achieved.

We should consciously use the imagery process as often as we can and wherever we can. If you can attach a verbal meaning to a concrete thing or concept, you'll have dual representation (verbal and visual); then the thing or concept is more likely to be lodged in the long-term memory and be available for later recall.

Effect on Memory and Time

Kenneth Higbee makes two more interesting points. First, concepts learned by imagery (visualization) last longer in the memory than concepts learned solely by verbal means. Second, learning something using the imagery process (right hemisphere) takes longer than when using the verbal process (left hemisphere). For example, in an experiment, it was found that it took only 4 seconds to read from a sheet the 26 letters of the alphabet, but to conjure up mental images of the 26 letters, it took 13 seconds,³ more than three times as long.

UNIQUENESS OF INNATE TENDENCIES

These inherited tendencies are very individualistic to some degree. A learning process that works excellently for you may not work so well for, say, your roommate. Furthermore, a learning process may work well for you in one subject, but no so well in another. Therefore, you need to do some personal exploring, researching, and observing to find the processes, techniques, and

²Kenneth L. Higbee, *Your Memory*, 2nd ed. (New York: Prentice Hall Press, 1988); pp. 38–40.

³*Ibid.*

systems that work best for you. Flexibility must permeate all of your learning processes.

I believe that the most important determination is whether you are predominantly stronger in the left hemisphere or the right. Why? Because, if your right hemisphere is by far the stronger, you want to take courses that deal with factual, concrete material. To take the liberal arts route, where the verbal skills predominate, you would not be using the stronger side of your brain. However, on the other hand, you do not want to cut yourself off from considering other choices. Michelangelo (1475–1564), Italian sculptor, painter, architect, and *poet*, must have had great verbal strength in his left hemisphere and great spatial relations strength in his right hemisphere. He used both hemispheres.

In the present era, Carl Sagan, an astronomer and author, currently a professor at Cornell University, gained fame in both the field of science (right hemisphere) as well as in the field of literature (left hemisphere). Among his best-selling books are *Pale Blue Dot* (1994) and *A Path Where No Man Thought* (1990).

How about your strengths? Take courses in the varied fields. Observe yourself. Do some introspecting. Record your evaluations and thoughts about these experiences. With your written history to pore over, your chances of coming up with a rational decision about your learning process are greatly enhanced.

Several Ways To Learn

Original learning and long-lasting remembering are best achieved when you use as many of your senses as possible. Your principal senses for learning are visual, auditory, and kinesthetic. Use them all and your chances of academic success are greatly enhanced. Use only one, and your chances of success are greatly diminished.

The use of several senses is clearly illustrated when you apply the recitation technique to lecture notes that were taken using the Cornell System. Here's how. The question in the margin is read *aloud*. Immediately you have involved at least two senses: sight (eyes) and sound (ears). You involve a third sense—kinesthetic—when you quickly write, on a separate sheet of paper, your answer. You continue using all three senses as you say aloud each word as you write it. You can extract even more from this type of recitation by visualizing yourself writing these answers as if you were writing them during an examination in your classroom.

Up to now, these are plain individual study skills, but you can blend them into your study habits and make this approach to lecture notes, as well as to your textbook assignments, *your personal study system*.

Adapting Standard Systems

You can be the architect of your personal study system using the textbook's techniques and ideas on how to study and how to learn. These are well-developed and well-researched materials that you can adapt and blend to construct your own study system.

For example, now that you understand the basic elements of taking notes, noting the key ideas, and mastering your material, you can combine these elements into your own study system, one that suits your particular needs.

Use the form on page 175 to list the steps in your custom-made study system and to summarize the process involved in each step. Then test your system. Use it to study a subject for one or two weeks; make sure you've clearly defined each step and put it in the right order. Based on what worked and what didn't, modify the steps or what they involve. Finally, place a copy of your system in the front of your notebook for easy access throughout the term.

Five Guidelines For Enhancing Learning

1. *Studying in groups.* Many variables enter into this method of learning. If all in the group have studied a particular chapter, a particular question, or a particular problem individually, then a discussion, in which all contribute, can be helpful to all. But, in many cases, some students who haven't done their individual work come to gain the information and knowledge "the easy way." One student who tried the group-studying approach said that he could hardly wait for the session to end so that he could get back to his room and study his own way. The best way to find out whether group studying can be made part of your learning system is to try it, then make a decision.
2. *Doing things.* Just about everyone learns better "by doing," because what has been studied is applied to some actual situation. However, only a few things can be translated into action; furthermore, "doing" takes a lot of time, and time is something most students do not have enough of. But, yes, "do things" when you can and when you have time.
3. *Reading slow or fast?* This should not even be a question. Your objective is to read to gain comprehension and to do this as efficiently as you can. However, for some ideas on reading, Chapter 7 is recommended. There you can find out how Daniel Webster read or how to read the "Intonation Way." These might jibe perfectly with your natural inclinations and fit into your personal study system.

A Personal Study System

In a brief statement, summarize the goal of your system (for example: to master textbook assignments using Cornell-style paper). Then jot down each step and an explanation of how it should be carried out. Limit your system to no more than seven steps so it is easy to remember.

Goal: _____

The Step

What It Involves

_____	_____

_____	_____

_____	_____

_____	_____

_____	_____

_____	_____

4. *Long blocks or short blocks of time while studying?* One or the other depends on the subject being studied, also on your natural propensity. Sticking too long to a subject at one sitting can build tension, so frequent breaks could be the answer. It's up to you to find what you can tolerate, then work the patterns into your study system.

5. *Pressure.* If you can't stand pressure, then work into your study system definite steps to preclude your being in a pressured situation. How? For example, start on the inevitable term paper on the very first day that it is announced. Another example is to begin study for tests and quizzes from the very first day of class by taking good notes, writing questions in the margins, reciting the answers to the questions, and reviewing these notes at least once a week. This book tells you how to cope with such studies. Work these methods and techniques into your study system.

Five Major Stages Of Learning

Jerome Bruner, a prominent psychologist and former director of Harvard University's Center for Cognitive Studies, characterized the art of learning in four stages, shown in the following diagram (Stages II, III, IV, V),⁴ on a continuum. Since Jerome Bruner did not start at the very beginning, I inserted Stage I and constructed the following model of knowledge.

Model of Knowledge

I Gaining Information	II Gaining Knowledge	III Storing Knowledge	IV Transforming Knowledge	V Using Knowledge
Lectures and Textbooks	Questions-in- the-Margins	Recitation Visualization	Reflection and Integration	Broadly in any field

In constructing your study system, you need to work into it ways to handle all of the stages in the Model of Knowledge diagram. For Stage I (Gaining Information), you already have the best methods and techniques for coping with information-laden lectures and textbooks. Work these methods into your personal study system.

⁴Jerome Bruner, *In Search of Mind* (New York: Harper & Row, 1983), p. 122.

For *Stage II* (Gaining Knowledge), the Questions-in-the-Margin Systems incorporate compactly in one unit a multitude of sound principles of studying and learning. Again, work these individual systems into your overall personal study system.

For *Stage III* (Storing Knowledge), you have the sound concept of recitation, which is stated by psychologists to be the most powerful and most readily available system for transferring information and knowledge from the short-term memory to the long-term memory. You can recite while you sit, stand in line, walk, or ride. What a great tool for learning!

For *Stage IV* (Transforming Knowledge), much has already been said about reflection. What is called *reflection* in this book, Jerome Bruner calls *intelligence* in his chapter, but it seems that both Jerome Bruner and I are talking about the same concept. He says:

Intelligence (or cognition) is the act of leaping beyond perception in some principled way, running beyond what is directly observed by the senses.⁵

Stage V (Using Knowledge). If you had used all the stages in this model, the knowledge that you would have gained would be so well integrated into your brain and being that it would be an inherent part of you; so, as you use this knowledge, it will be used as an integrated whole, not compartmentalized, when you speak, write, or think. This knowledge is so thoroughly bonded that it is all *you*.

Personalizing A Standard System

One student put his own numerous touches to the Questions-in-the-Margin System by writing the questions in the wider margin, using slanted lines to mark off the portions of the text on which the questions are based, and numbering the marked-off portions of the text as well as the questions so that both could be easily matched. To make such dense writing both legible and small enough to fit in the limited space, the student used a mechanical pencil with 0.3 mm lead, rather than the thicker 0.5 mm lead.

DO YOUR THINKING BY SKETCHING

A good example of thinking by sketching is Figure E.1, which illustrates the notes made by Richard Feynman as he strove to unlock the secrets of the atom

⁵Jerome Bruner, *In Search of Mind* (New York: Harper & Row, 1983), p. 115.

while working with other scientists in the Manhattan Project during World War II. He used this schematic "for keeping track of the zigs and zags" of an atom particle.⁶

Following Your Circadian Rhythms

Each student has his or her sleepy periods, as well as wide-awake periods. You might experience a drowsy period directly after lunch. You need to recognize your cycles and plan your time schedule to do active types of studying during sleepy periods, and textbook reading during your wide-awake periods. Some students carry this knowledge of personal cycles further; for example, if you are an OWL, that is, study and learn better in the evening, then you should schedule your most difficult subjects accordingly. If you are a LARK, that is, are more alert and learn more easily in the morning, then studying in the morning hours should be your choice. For example, one student, a *lark*, adjusted his living schedule: bed by 9 and up by 5. He even shaved before going to bed to provide more solid study time for the morning hours.

Learning and Living Your Way

You could benefit greatly by analyzing the many techniques, methods, and systems put forth in this book to see how you could adapt them to fit into your overall personal study system. Observe, too, the hours during which you are more alert and work best. Once you have honed your study system and determined a practical time schedule, combine them so you can end up learning and living *your way*.

⁶James Gleick, *Genius, The Life and Science of Richard Feynman* (New York: Pantheon Books), 199 pp. 230-231.

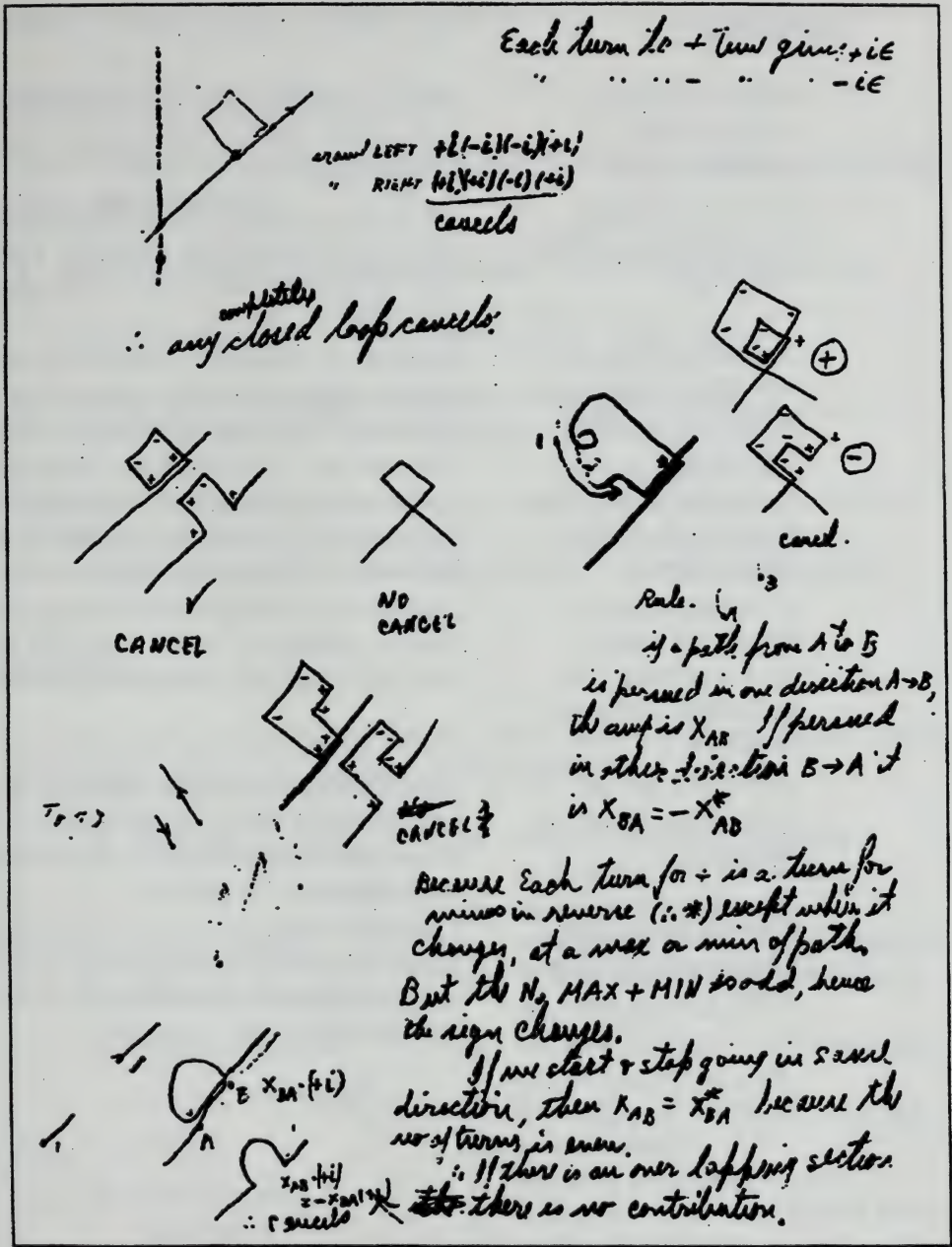


FIGURE E-1. Thinking by Sketching

Illustration by Richard Feynman. Courtesy of the Archives, California Institute of Technology.

SUMMARY

What is meant by “hemispheric specialization”?

Does the stronger hemisphere do all the thinking?

Learning things via the right hemisphere takes longer. Why?

Studying in groups seems like a sure way to gain a lot in joint effort. Is it so?

If everyone learns better “by doing,” why not make this technique a general practice?

How can I use the “Five Major Stages of Learning”?

How do living styles affect one’s learning style?

The left hemisphere is specialized in language and speech, whereas the right is specialized in spatial relations.

No. Both contribute in the thinking process, but depending on the nature of a problem, one hemisphere might contribute more than the other.

Because to visualize consciously whatever you’re trying to learn is a longer time-process than understanding an abstract word.

Yes and no. If all members come prepared, much can be gained by all. Conversely, if ill-prepared, it could be a waste of time. To find out, try the process several times.

Because not all subject matter is in a form that can be handled or even mentally manipulated or visualized. Many ideas are abstract.

Take each of the stages and try to meet the goal of each stage by working into your personal learning style a system or technique for each stage.

Learning styles are “good intentions.” To make them work academically, you have to use them vigorously during the hours when you are most alert and active.

HAVE YOU MISSED SOMETHING?

Sentence Completion

Complete the following sentences with one of the three words or phrases listed below each sentence.

1. The left hemisphere possesses language and speech mechanism in _____.
half the population exceptional people most people
2. In most people, the right hemisphere works best with _____.
words in textbooks concrete events words in novels
3. Most information is amenable to be learned and understood best by using _____.
the left hemisphere both hemispheres the right hemisphere

Matching

In each blank space in the left column, write the letter preceding the phrase in the right column that matches the left item best.

- | | |
|---------------------------------|---|
| _____ 1. Memory | a. Idea of storing information as both words and pictures |
| _____ 2. Gaining information | b. Normally fall under the jurisdiction of the brain's right side. |
| _____ 3. Dual coding | c. Strengthened when both sides of the brain are used |
| _____ 4. Using knowledge | d. Usually fall under the jurisdiction of the brain's left side |
| _____ 5. Spatial relations | e. Reading your textbook or taking lecture notes |
| _____ 6. Storing knowledge | f. Reciting your lecture notes |
| _____ 7. Words | g. Using ideas and facts gained from textbook and lectures and applying them to other tasks |
| _____ 8. Transforming knowledge | h. Reflecting on the ideas put forth by the lecturer |

True-False

Write *T* beside the *true* statements and *F* beside the *false* statements.

- _____ 1. You should always read at a constant rate of speed.
- _____ 2. Most of the benefits of reflection can be obtained from conventional studying.
- _____ 3. Artistic ability isn't necessary for drawing pictures to help you use the right hemisphere when studying.
- _____ 4. If your right hemisphere is stronger, you should do well in engineering courses.
- _____ 5. In studying, if you're running out of time, the left hemisphere will probably take over.
- _____ 6. Everybody in group study gains.

Multiple Choice

Choose the word or phrase that completes the following sentence most accurately, and circle the letter that precedes it.

- 1. Reflection is done by
 - a. rearranging.
 - b. comparing.
 - c. questioning.
 - d. doing all the above.
- 2. The most important aspect of any study system is
 - a. an oversized margin.
 - b. the surveying step.
 - c. an active approach.
 - d. a memorable name.
- 3. Concepts learned by imagery
 - a. take less time than those learned by verbalizing.
 - b. are weaker than those learned verbally.
 - c. last longer in memory.
 - d. work best with abstract material.

4. Original learning and long-lasting remembering are best achieved when
 - a. the left hemisphere is used.
 - b. the abstract materials are blended with the concrete.
 - c. the right hemisphere is used.
 - d. many senses are used.
5. No single activity is more important to strengthening memory than
 - a. rereading aloud.
 - b. careful revising.
 - c. reciting aloud.
 - d. none of the above.

Short Answer

Supply a brief answer for each of the following items.

1. Explain the difference between left and right sides of the brain.
2. If you were the organizer of a group for studying, what specific steps would you take to ensure its success?
3. Explain why each person is unique. Give specific examples.
4. In the "Five Major Stages of Learning" diagram, which stage is the most important? Give your reasons.
5. What would be the most important element of your personal study system, and why?

Vocabulary Building

Directions: Make a light check mark (✓) alongside one of the three words (choices) that most nearly expresses the meaning of the italicized word in the phrases that are in the left-hand column. (Answers are given on p. 184.)

	1	2	3
1. who are <i>ambidextrous</i>	versatile	wandering	unskilled
2. <i>kinesthetic</i> sense	relative	pleasing	muscular
3. many <i>variables</i> enter	constants	changes	colors
4. your natural <i>propensity</i>	inclination	aversion	talent
5. this <i>morass</i>	island	overburden	gulf
6. years have been <i>tumultuous</i>	turbulent	quiet	rewarding
7. held in low <i>esteem</i>	disdain	rank	honor
8. more than a <i> cursory</i> analysis	brief	careful	helpful
9. an old market <i>adage</i>	trick	strategy	saying
10. accurately <i>portrays</i> the tone	depicts	betrays	carries
11. <i>euphoria</i> surrounding sales	uproar	sorrows	joy
12. be <i>skeptical</i> of good news	doubtful	certain	expectant
13. a <i>resounding</i> no	silent	definite	distant
14. has been its <i>nemesis</i>	ally	charm	downfall
15. <i>demise</i> of inflation	study	death	birth
16. some <i>peripheral</i> event	fringe	central	temporary
17. the <i>precarious</i> economy	stable	advanced	uncertain
18. <i>imprudent</i> bankers	rude	wise	rash
19. face <i>intractable</i> problems	docile	stubborn	domestic
20. for the <i>subsequent</i> rally	successful	previous	following
21. the business is <i>solvent</i>	sound	bankrupt	serious
22. without <i>debas</i> ing money	altering	elevating	lowering
23. <i>surreptitiously</i> watching	overtly	covertly	consciously
24. to <i>perpetuate</i> the illusion	obliterate	continue	emphasize
25. two <i>frustrating</i> years	satisfying	gratifying	bafling

Additional Multiple-Choice Questions

- All learning is processed by
 - the left hemisphere.
 - a combination of both hemispheres.
 - the right hemisphere.
 - all the above.
- In most humans, the right hemisphere specializes in
 - abstract concepts.
 - the written word.
 - concrete events.
 - all the above.

3. Concepts remain longer in the memory when learned by using
 - a. recitation.
 - b. reflection.
 - c. imagery.
 - d. verbal means.
4. It takes longer to learn something by using
 - a. verbal processes.
 - b. imagery.
 - c. sight.
 - d. hearing.
5. Learning will be long lasting when learned by using the
 - a. visual sense.
 - b. auditory sense.
 - c. kinesthetic sense.
 - d. all the above.
6. Studying in groups is helpful when the group has
 - a. a strong leader.
 - b. sufficient time.
 - c. an imminent exam.
 - d. contributions from all.
7. The end product of Jerome Bruner's "the art of learning" is
 - a. gaining knowledge.
 - b. using knowledge.
 - c. transforming knowledge.
 - d. storing knowledge.
8. The study system to use to transform knowledge is
 - a. reflection.
 - b. recitation.
 - c. visualization.
 - d. questions-in-the-margin.
9. In solving a problem, a good way to use the two hemispheres, as well as the kinesthetic and visual senses, is to
 - a. sketch diagrams.
 - b. jot down brief thoughts.
 - c. write out possible formulas.
 - d. do all the above.

10. In planning their study schedules, students should take into consideration their
- study speeds.
 - number of courses.
 - circadian rhythms.
 - all the above.

ANSWERS FOR CRITICAL PATHWAYS

Sentence Completion

1. most people 2. concrete events 3. both hemispheres

Matching

1. c 2. e 3. a 4. g 5. b 6. f 7. d 8. h

True-False

1. F 2. F 3. T 4. T 5. T 6. F

Multiple Choice

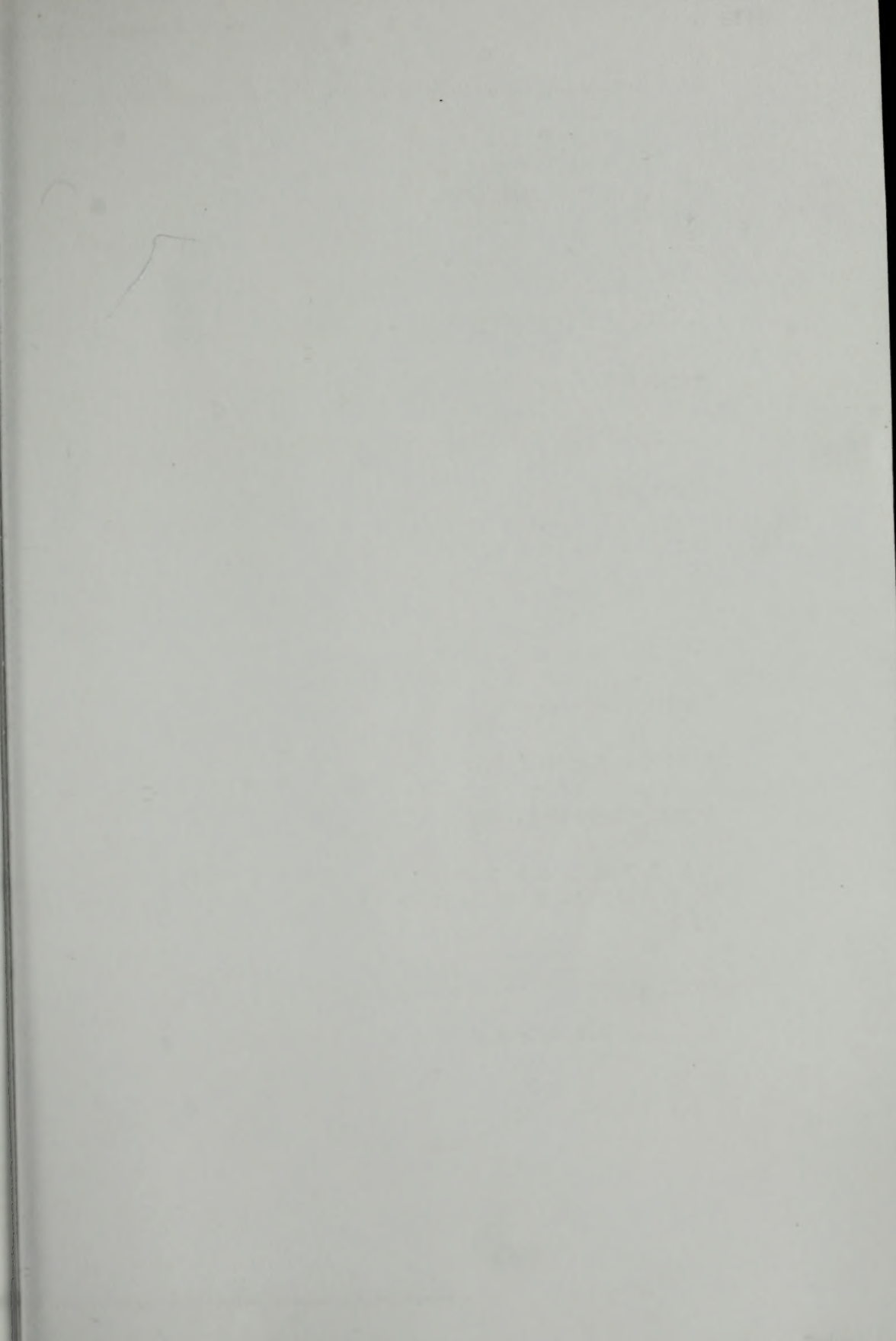
1. d 2. c 3. c 4. d 5. c

Vocabulary Building

1. 1 2. 3 3. 2 4. 1 5. 2 6. 1 7. 1 8. 1 9. 3 10. 1 11. 3 12. 1 13. 2
14. 3 15. 2 16. 1 17. 3 18. 3 19. 2 20. 3 21. 1 22. 3 23. 2 24. 2
25. 3

Additional Multiple-Choice Questions

1. d 2. c 3. c 4. b 5. d 6. d 7. b 8. a 9. d 10. d





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ISBN 0-618-26842-1



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N-01099